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In 1964 the state enacted a Community College Act which established a statewide system of several community college campuses under the administration of the University of Hawaii Board of Regents. The community colleges, varying in size and program emphasis, are intended to be comprehensive in nature with a nucleus of college transfer and occupational programs. This report of a study by a consultant is to be used to establish guidelines for the development of occupational education programs. Skilled manpower, suggested educational programs, occupational education curriculum, student services, administration and staffing, facilities, and finance are discussed. Some of the recommendations were (1) Establish a system of "open-door" comprehensive community colleges to expand educational opportunity throughout the state, (2) Use high-level advisory committees at a statewide level, (3) Adopt an over-all planning scheme on a "systems analysis" approach, (4) Provide for equal emphasis on occupational education and college-parallel education and be sure each administrator is in accord with this philosophy, (5) Conduct community surveys in each county before phasing into community college operation, (6) Strive to obtain a reasonable balance between local persons and persons from the mainland in the staffs, and (7) Keep the tuition as low as possible. (MM)

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CURRICULUM DEVELOPMENT FOR HAWAII'S COMMUNITY COLLEGES

WITH EMPHASIS ON OCCUPATIONAL EDUCATION

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CURRICULUM DEVELOPMENT FOR HAWAII'S COMMUNITY COLLEGES

With Emphasis on Occupational Education

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December, 1964

FOREWORD

The State of Hawaii in 1964 enacted a Community College Act (Act 39, Session Laws of Hawaii 1964) which establishes a statewide system of several community college campuses under the administration of the University of Hawaii board of regents. The Act further states that the existing technical schools of the State be incorporated into the community college system.

Hawaii's community colleges, varying in size and in program emphasis, are intended to be comprehensive in nature. Each will have a nucleus of college transfer and occupational programs.

It is in the increasingly important area of occupational education that Hawaii's community colleges can be of great service to the State. Assuming jurisdiction of the technical schools makes the University of Hawaii all the more conscious of its responsibility in this field.

As a first step in the establishment of Hawaii's community colleges, it was decided to establish guidelines for the development of occupational education programs. For this task, the University secured the services of Professor Norman C. Harris from The University of Michigan, Center for the Study of Higher Education.

Professor Harris spent two months in Hawaii, from October 15 to December 15, 1964. Although he himself will be first to admit that this was not time enough to become thoroughly acquainted with all of the problems and opportunities in this area, Professor Harris' wide experience and intimate knowledge of the many facets of community college operations, and particularly of occupational education, enabled him to observe perceptively and to evaluate constructively. His report contains specific and helpful recommendations. While in Hawaii, Professor Harris met with many individuals and groups and did much to increase our understanding of community college operations; for this, we are indeed grateful.

This report, written with understanding and candor, should serve Hawaii well as it attempts further to enlarge the educational opportunities of its citizens by establishing community colleges.

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January, 1965

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Chapter I

SKILLED MANPOWER AND THE COMMUNITY JUNIOR COLLEGE

It is difficult for the imagination to grasp the real impact of the revolution which an exploding technology has brought in the short span of three decades. Significant worldwide challenges are confronting man's political, economic, social, and educational institutions. Changes in these institutions are occurring with startling rapidity and the only safe supposition is that the rate of change will accelerate in the years ahead. Though political, economic, and social changes affect us all and are mutually related to educational change, it is the latter with which we are directly concerned in this report.

The discussion and recommendations in this document are the outgrowth of a two-month study of the early beginnings of the community college movement in Hawaii. Especial emphasis in the study and in this report is on the needs for post-high school occupational education and on the kinds of programs which should be offered.

This opening chapter will attempt to relate economic change to educational change and will specifically concern itself with the educational developments required to meet the new emphasis which a changing occupational structure is placing on skilled and semi-professional manpower.

Employment and Unemployment -- Three Examples. In the manufacturing industries the nation has moved in thirty years from a work force structure which placed major emphasis on semi-skilled and skilled workers to one which now stresses the importance of technical, semi-professional, and professional workers. The capital investment per basic job in heavy industry today is approaching $30,000. As capital funds accumulate in advanced industrial societies, they must be put to work -- either by men or by machines. If $30,000 or more of capital is to be tended, a man (well educated and trained) will probably get the job. If a smaller amount of capital is involved, a machine will probably get the nod. Repetitive jobs, involving simple skills and/or manual labor, are now the domain of the machine, not man; and the machines themselves are increasingly being sequenced and controlled by other machines, not men. The demand for highly-skilled workers in the manufacturing industries remains fairly firm, but industry's need for semi-skilled workers is gradually decreasing, and the need for unskilled workers is decreasing at a rate which predicts 1970 as the practical vanishing point in time for the "unskilled job."

The above trend is just as evident in agriculture as it is in industry. Fifty years ago one farmer, by his and his family's labor, produced enough for the family and six other persons. By 1960, one farmer, in an era of mechanized and chemically fertilized agriculture, was producing enough for twenty-five others. Seven per cent of the population of the United States is producing all the food and fiber needed by the entire nation plus enough to meet our export markets and pile up troublesome surpluses of many commodities besides. "Farm labor" is a disappearing segment of the labor force -- the farm is no longer a haven for the unskilled and uneducated laborer. This is not to say that agriculture is not creating new jobs -- it is; but the new jobs are more often related to food processing, agricultural research, marketing and distribution, and to servicing the needs of farmers for machinery, pesticides and fertilizers, than they are to agricultural production. These new jobs in agri-business and agricultural technology require a new kind of worker -- one with education and training far beyond that of his predecessor who labored in the fields.

The whole field of business enterprise also reflects the technological revolution. The business office, never a source of jobs for the unskilled, was, until a decade or so ago, a ready source of jobs for semi-skilled and skilled workers. Millions of persons, comprising perhaps 20 to 25% of the total labor force of the nation, are employed in clerical and kindred jobs. No significant decline in absolute numbers of business office jobs can yet be noted, but the nature of these jobs is, nevertheless, changing rapidly. The routine jobs -- filing, checking, posting, billing, telephone operating, packaging, and inventorying, for example -- are being gradually taken over by machines, swept up in the cybernetic revolution of our time. The total number of business office jobs is holding up, even increasing slowly, but the inexorable shift to more sophisticated jobs places a premium on education. The old, simple, routine jobs are disappearing and the new, more complex jobs require persons with greater insights and with advanced levels of education and training.

The distributive phases of business, involving buying, selling, advertising, shipping and warehousing -- activities requiring a knowledge of finance, consumer demand, mass psychology, economics and logistics -- have never been a source of jobs for the unskilled and uneducated. Most of these "white collar" and "clean coverall" jobs were at one time open to the ambitious high school graduate and some of them still are; but more and more often the new job openings involve concepts and activities (data processing, planning, estimating, human relations, graphic arts, business management) which are far beyond the maturity level and the educational attainments of the new high school graduate.

In industry, in agriculture, in the business world; wherever people work, wherever people look for work; the message is clear and unmistakable -- education is the key which opens the door to employment. Grant Venn, in the recent American Council on Education study entitled Man, Education, and Work[1] expresses the same thought when he concludes, "Education stands squarely between man and his job."

Education and the New Technology. The basic educational problem posed by the new technology is that of educating and training all young people for the world of work. Added to this is the very urgent problem of re-educating and re-training large numbers of adults who already have become, or may shortly become, victims of technological unemployment. The "education for the world of work" theme has received so much publicity in the past two or three years that almost everyone is in sympathy with proposals to "do something about it." Civic groups and legislators, as well as educators, are now clamoring for increased attention to occupational education. Recent federal legislation (P.L. 88-210) has recognized a federal interest in the problem and has authorized increased federal financial assistance for vocational education. State school officers in all the states are giving greater attention to "vocational education." Such interest is long overdue but we must be extremely careful, in the words of Santayana, not to "redouble our efforts as we lose sight of our goals." Some of the proposals which fall into this questionable category are:

1. Establish a national system, or state systems, of vocational high schools beginning at the 9th or 10th grade level, separate from academic high schools. This proposal is based on two implied judgments:
    a. Some young people are destined by inherited and environmental factors to do the world's work, and others are destined to be professional and intellectual leaders.
    b. It is not only possible, but desirable, to identify these two groups, and separate them at about age fifteen.
2. Let the existing (comprehensive) high schools take care of vocational education. Give them the funds to provide shops, laboratories, and training stations and to employ competent faculty members to get the job done.

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[1] Venn, Grant, Man, Education, and Work. The American Council on Education, Washington, D. C., 1964.

The assumption here is that, with proper facilities and good teachers, young persons can be effectively prepared for the broad spectrum of today's jobs in a three- (or four-) year educational program ending (for most students) at about age 17, and resulting in job placement. Such an assumption is contrary to fact in every state in the union.

3. Establish a system of post-secondary vocational-technical schools across the nation, which will concentrate on highly specialized occupational training.

   Proponents of this movement feel that the increased maturity represented by age 19 or 20 will permit effective occupational training. This thesis can be defended, but some other (implied) assumptions are not as well founded:

   a. High school graduates fall neatly into two categories: (1) those who are qualified for "college study" and an eventual baccalaureate degree, and (2) those who are better suited to and who have irrevocably decided upon a career in the technical, skilled, or semi-skilled occupations.
   b. All (or almost all) of the general education, or "common learnings" content, needed by young people to enable them to function effectively in today's society, has been provided by the high school. Furthermore "employment-bound" students are not interested in courses like English, history, mathematics, economics, science, or psychology, anyway.
   c. The training needs of industry and business are readily identifiable and job demands have enough stability to justify the establishment of highly specialized, job-oriented, training programs to prepare workers for their "lifetime job."

It is suggested that all three of the above proposals represent the hustle and bustle of "effort" rather than the careful examination of goals. The assumptions implied in each of these proposals are, to say the least, open to serious question. Let us consider some of the weaknesses of these assumptions.

The new technology requires education and training of the individual as a thinking, problem-solving person, rather than as a trained automaton engaged in repetitive work, and man will compete successfully against machines only by virtue of his abilities with mental processes. Work uses more and more of an individual's mental capacity -- it is more cognitive than ever before and is therefore more and more like education itself. Education for work certainly must include excellent preparation in specific skills but also it has become increasingly dependent on supporting scientific and technical knowledge, on basic (general) education skills, and on behavioral and humanistic knowledge, as well.

Since the content and complexity of occupational education must keep pace with the changing needs of society, it is doubtful indeed that a system of vocational high schools (whose students, by and large, would be those in the lower academic ability range) would serve the nation's need.

Since maturity, adult judgment, and relatively sophisticated levels of knowledge and skill are all required for most of the "new" jobs today, it is highly unlikely that the comprehensive high school can, by "redoubling its effort" in vocational education, serve as the major center for occupational education.

And, since workers are also citizens in an ever more complex society; since job requirements are ever-changing and involve more theoretical knowledge than ever before; since flexibility and mobility are necessary attributes of workers at all levels; it is probable that the job-oriented vocational-technical school concept is also more closely associated with "redoubled effort" than it is with clarity of vision.

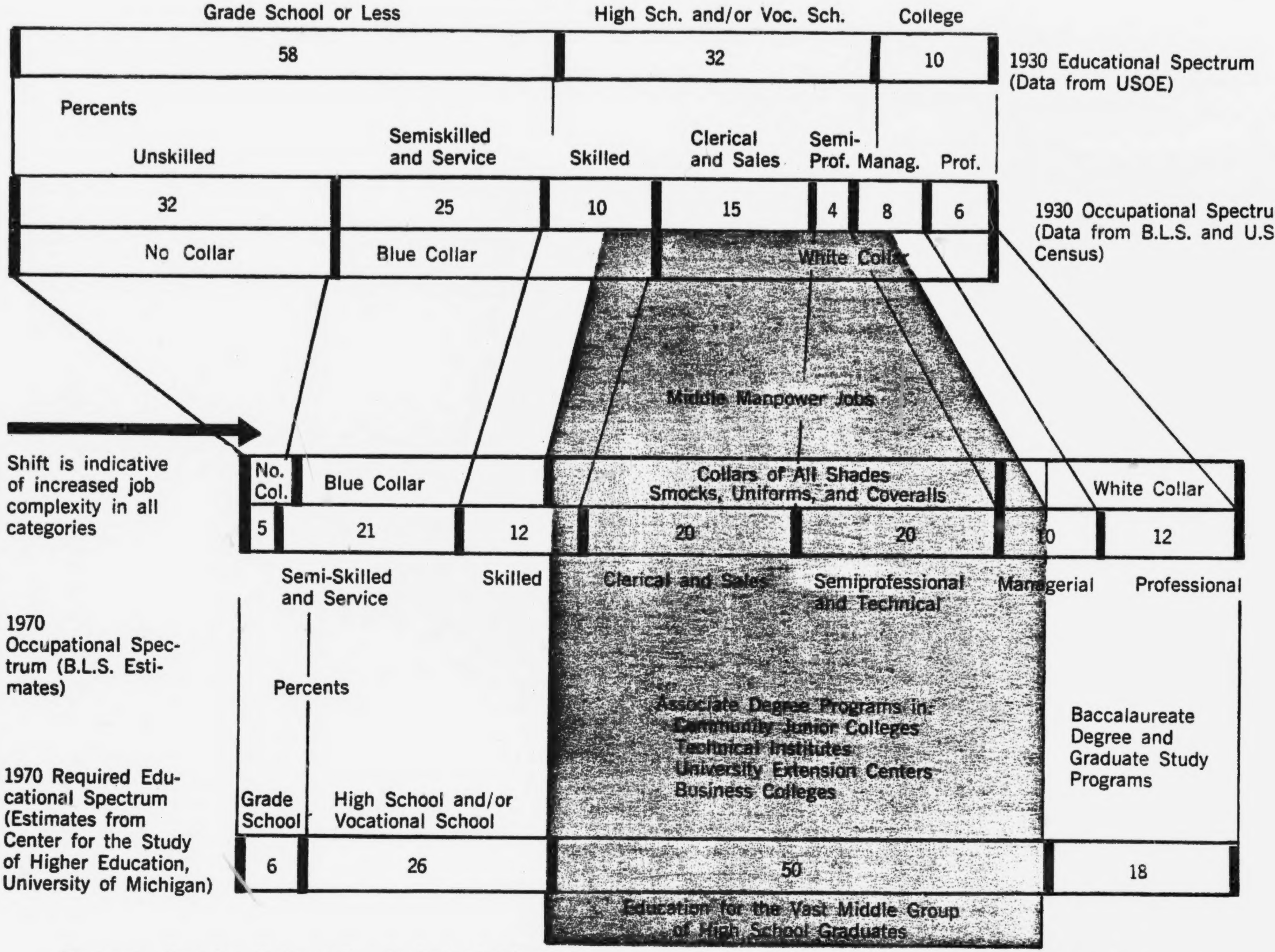
Occupational education for "middle manpower" (i.e., highly-skilled, technical, and semi-professional jobs) is more and more a responsibility of colleges. And of the several kinds and "levels" of colleges, it is the community (junior) college which holds forth the greatest promise for meeting the occupational education needs of the nation and of the nation's youth. Figure 1-1 will perhaps clarify the changing occupational structure and lend support to the expanding role of the community junior college in occupational education.

The upper half of the chart compares the 1930 educational spectrum with the occupational structure of that decade. Note that the three-level educational system roughly sorted young people into the various occupational categories shown.

In the present decade, and most certainly by 1970, this three-level educational system is grossly inadequate. Relatively few unskilled and semi-skilled jobs remain on the one hand, and markedly increased numbers of jobs at the professional and managerial levels exist at the other end of the spectrum. And in the center of the occupational distribution approximately one-half of all jobs are now "middle manpower" jobs, requiring training and/or education beyond high

Figure 1-1

OCCUPATIONAL TRENDS AND EDUCATIONAL REQUIREMENTS
(U.S. Labor Force—1930 and 1970)


Grade School or Less
High Sch. and/or Voc. Sch.
College
58
32
10
1930 Educational Spectrum (Data from USOE)
Percents
Unskilled
Semiskilled and Service
Skilled
Clerical and Sales
Semi-Prof.
Manag.
Prof.
32
25
10
15
4
8
6
1930 Occupational Spectrum (Data from B.L.S. and U.S. Census)
No Collar
Blue Collar
White Collar
Middle Manpower Jobs
Shift is indicative of increased job complexity in all categories
No. Col.
Blue Collar
Collars of All Shades Smocks, Uniforms, and Coveralls
White Collar
5
21
12
20
20
10
12
Semi-Skilled and Service
Skilled
Clerical and Sales
Semiprofessional and Technical
Managerial
Professional
1970 Occupational Spectrum (B.L.S. Estimates)
Percents
Associate Degree Programs in:
Community Junior Colleges
Technical Institutes
University Extension Centers
Business Colleges
Baccalaureate Degree and Graduate Study Programs
1970 Required Educational Spectrum (Estimates from Center for the Study of Higher Education, University of Michigan)
Grade School
High School and/or Vocational School
6
26
50
18
Education for the Vast Middle Group of High School Graduates

Source: Harris, Norman C., Technical Education in the Junior College/New Programs for New Jobs, American Association of Junior Colleges, Washington, D. C., 1964, p. 27.

school, but not necessitating a baccalaureate degree. Community junior colleges, technical institutes, and business colleges are the kinds of educational institutions on which we must now rely to provide this middle manpower. By virtue of the fact that (1) it has the enrollment capacity, and (2) it encompasses a philosophy of education rather than job training, the community college is the institution which is emerging as the best answer to middle manpower education.

The Economic Impact of Higher Education. Even persons who are not students of economics have probably often wondered why some regions and some countries have a higher standard of living and more productivity than others. In earlier times the primary reasons were an industrious labor force, better natural resources, greater capital formation, or all three of these. "Work, save, and manage your money" could have been the slogan for 19th century economic development. But natural resources certainly do not explain why Sweden or Switzerland today have standards of living far above those of such nations as Brazil or Indonesia, where bountiful natural resources are available.

And, in recent years, it has become increasingly evident that mere monetary capital is not sufficient to maintain a steadily expanding economy in a nation or a region. Certainly long hours of work (14 hours per day or 60 hours per week) are not any longer a necessity for economic development.

It is an interesting phenomenon that nations which are now enjoying a high rate of economic growth and high per capita income are those nations where human capital formation -- the all-out development of knowledge, skills, and abilities of people -- is receiving major attention. Money and minerals -- well known measures of wealth for centuries -- are now giving way to education and training as parameters of economic development. The following table suggests, for a few selected countries, the relationship between income and educational development.[1]

Table 1

Natural Resources, Educational Development, and Income per Capita (1954) for Selected Countries

Nation	Natural Resources	Educational Development	Income per Capita
United States	high	high	$1,370
New Zealand	high	high	1,000
Switzerland	low	high	1,010
Denmark	low	high	750
Colombia	high	low	250
Brazil	high	low	230
Mexico	high	low	220

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[1] Norton, John K., "Education Pays Compound Interest," National Education Association Journal. 47:557, November, 1958.

Education's Return to the Individual. There is little doubt that investment in education is highly rewarding to individuals. The lifetime earnings of college graduates in the United States are, on the average, much greater than the lifetime earnings of persons with only a high school education, even when making due allowances for the earnings foregone while attending four more years of school. Schultz[1] reports a recent study by Becker and others which predicts that for a large group of men who graduated from high school in 1954, those who subsequently completed college will on the average earn $151,000 more by age 64 than will the group which only completed high school. The additional cost (including "earnings foregone" while in college) of the college years was estimated to be $13,780, giving a ratio of additional earnings to additional cost of 10.96. The comparable ratio in 1939 was 8.97.

Education's Return to Society. But education benefits not only those who receive it, it benefits the entire economy as well. Edward F. Denison,[2] in a research study completed in 1962 for the Committee for Economic Development, made an analysis of economic growth sources in the United States for the period 1929 - 57, and then made projections for the period 1960 - 80. The following table presents Denison's estimates of economic growth sources in the United States.

Table 2

Estimated Sources of Economic Growth in the United States
1929-57 and 1960-80

Growth Source	Percent of Growth Rate 1929-57	1960-80
Decrease in annual hours worked	- 33	- 26
Effect of shorter hours on work quality	21	4
Education	42	40
Advances in knowledge	36	46
Better utilization of women	7	6
Capital	9	9
Economies of scale - national market	17	17
Economies of scale - local market	4	3
Other factors	- 3	1
Total	100	100

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[1] Schultz, Theodore W., "Education and Economic Growth," *NSSE Yearbook*, 1961, Part II, Nelson B. Henry, Ed., Chicago, 1961.

[2] Denison, Edward F., *The Sources of Economic Growth in the U.S. and the Alternatives Before Us*, Committee for Economic Development, Suppl. paper No. 13, New York, 1962.

Note that the factor "advances in knowledge" accounts for a very significant growth potential. But note also that "education" -- learning by the general population that which is already known by a few -- accounts for about the same growth rate. Our major universities and research centers are producers of knowledge and they provide the intellectual capital essential to economic growth for the nation. Higher rates of money investment in these institutions will pay off handsomely in the years ahead. Community junior colleges, on the other hand, are disseminators of knowledge, serving the vast middle group of high school graduates. They provide the semi-professional and technical human capital, without which the thrust of new knowledge would lose its driving force. Higher rates of monetary investment in the two-year colleges are a must also, if a state or region expects significant economic growth.

Many factors operate to produce or control economic growth in a state or region, and no claim can be made that education of and by itself is responsible for jobs, or for income, or for a specific rate of economic growth, but it is instructive to make some comparisons for certain areas of the United States. The data in Table 3 are taken from the 1960 census.

Table 3

Statistics on Education and Family Income --
U.S. and Selected Regions and States, 1960

Region, Division or State	Percent of School Age Population Enrolled in School, by Age Group			Yrs of School Completed by Persons 25 Years and Over % Adults Who have Completed		Median School Years Completed	Median Income of Families & Unrelated Individuals '59, $s
	18-19	20-21	22-24	1-3 yrs Col.	4 yrs or More College		
United States	42.1	21.1	10.2	8.8	7.7	10.6	$4791
Regions							
Northeast	42.5	22.9	10.7	7.7	8.1	10.7	5337
North Cent.	43.0	21.4	10.0	8.6	6.9	10.7	5095
South	40.3	19.0	8.9	7.9	7.1	9.6	3692
West	43.8	22.3	12.3	12.7	9.6	12.0	5276
States (selected)							
New York	43.1	23.7	11.6	7.9	8.9	10.7	5407
Michigan	44.2	21.7	10.8	8.1	6.8	10.8	5534
N. Carolina	38.5	17.3	6.9	7.1	6.3	8.9	3334
Arkansas	44.0	20.8	11.0	6.2	4.8	8.9	2629
California	40.8	21.5	12.3	13.4	9.8	12.1	5527
HAWAII	34.4	15.7	8.7	7.5	9.0	11.3	4710

Source: U.S. Bureau of the Census. 1960 Census of Population, Volume I, Characteristics of the Population, General Social and Economic Characteristics, U. S. Government Printing Office, Washington D. C. Tables 114 & 115.

As an inference from these data, it would seem strongly advisable to place more emphasis on higher education in Hawaii if human capital formation is to be used as an instrument of economic growth. And, although serious and continuing consideration should be given to investment in universities and research centers on the one hand, and on the K-12 public school program on the other, immediate and urgent attention should be given to the expansion of educational opportunity at the community college level for thousands of youth whose potential for contribution to the economy of the state is now much underdeveloped. The rather striking differentials between the southern region and Hawaii on the one hand and the western region (particularly California) on the other, in the "1 to 3 years of college" column are readily apparent.

In closing this section on the economic impact of education a quotation from an article by Dr. Lee R. Martin, in a recent issue of Higher Education in New England,[1] is worthy of consideration.

> What is required is a different view of education. If education were entirely taken to be an item of consumption, like a high-priced automobile, then it would be proper for the individual or the government to expend for it only what they could afford. . . . . But education is an investment that benefits both the individual and his society, and thus these expenditure decisions should be made just like the decision by a business firm to purchase income producing assets. . . . . . . What can be afforded has nothing to do with this decision. If the investment results in annual additions to income that are greater than the annual costs of the investment, then the investment is justified economically, even if funds must be borrowed or taxes increased in order to finance it.

Some Factors of Importance. In concluding this introductory chapter six significant factors about the community college will be identified, which point to it as the probable best answer to the skilled manpower problem in Hawaii, as it is in many other states.

1. Community (junior) colleges are already established in more than thirty states and are currently being planned in a dozen more. Nearly 440 publicly-supported community colleges are now in operation, with twenty or more new ones having been added each year for the past several years. The total enrollment in these institutions is now over the million mark and it has been growing by 10 to 15% annually, in recent years. A conservative estimate would indicate a total enrollment of over two million students in 650 or more colleges by 1975.

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[1] Martin, Lee R., "Contributions of Education and Research to Economic Growth," Higher Education in New England, Vol. 6, No. 4; Vol. 7, No. 1, Winter and Spring, 1963, p. 12.

2. Community colleges are already recognized by students, parents, and lay citizens in general as being institutions with a comprehensive purpose, offering both occupational education programs and college parallel programs, each of high quality and each at the level required for its intended purpose. "Quality within diversity" is the policy of the community college.
3. Such colleges are (typically) located close to the student's home, making access to higher education readily available and relatively inexpensive. Tuition is free in some states, nominal ($200 per year average) in others. The total out-of-pocket cost to a family for a student year at the local community college would ordinarily not exceed $500, whereas sending the same student away to a technical institute, a four-year college, or a university might well cost from $2,000 to $4,000, depending on the tuition charges and the travel distances involved.
4. Community colleges maintain close liaison with the high schools in their attendance areas, and the testing and counseling services of the college are ordinarily available to high school seniors to help them effect a smooth transition from high school to college. The college guidance services assist students to come to realistic career and educational decisions, and the college policies allow for changes in courses, curriculums, and educational objectives. The comprehensive nature of the college does not force students into irrevocable career decisions as they register, but allows undecided students to "find themselves" before firm decisions about lifetime careers have to be made.
5. Increasingly, high school graduates want to go to college, and their parents expect them to. Enrolling in an accredited community college has acceptance already in the public mind. Whether a student elects an occupational curriculum at the outset, or changes to such a curriculum later from a transfer program, the concept of his role as a college student remains unchanged. Both transfer courses and occupational courses carry college credit and both lead to the associate degree. (The difference is that transfer level courses also carry lower division baccalaureate degree credit, whereas most occupational education courses do not.)
6. Finally, and most important, community colleges have the educational philosophy, the facilities, and the faculty to incorporate with occupational education curriculums a selected core of the "common learnings" --

courses in English, mathematics, the social sciences, the humanities, and the natural sciences. Such courses are planned and taught with the needs, interests, and academic abilities of occupational education students in mind. The general education core may make up one-fourth of the two-year program of approximately seventy semester credit hours.

Summary. The essential purpose of American education is not to *train* workers, as some advocates of crash programs in vocational education seem to be proposing. The essential purpose is to educate youths and adults alike for the responsibilities and privileges of a free society. But it must be recognized that high on the list of these are the *privilege of having a job and the responsibility to perform it well*. Just as the "vocational educators" are wrong when they denigrate the value of general education, so are the "academicians" mistaken when they proclaim that "the best vocational education is a major in the liberal arts." This age-old debate between the academician and the vocationalist has continued long past the time when it has any real meaning, and it should cease forthwith.

For a great majority of youth today post-high school education of one or two years' duration is becoming a necessity. Its content should consist of specialized occupational training, a strong base of supporting technical and theory courses, and a generous core of the common learnings. The community college is already identified in more than thirty states as the institution which can best perform this educational task.

Chapter II

THE COMMUNITY COLLEGE IN HAWAII

Since the background of events leading to enabling legislation for community colleges in Hawaii is a matter of public record, only a short resumé of these developments will be given here, to serve as an introduction to the discussion to follow. The main body of this chapter will deal with some general guidelines for the future development of Hawaii's community college system. Later chapters will deal with a variety of topics in greater detail.

The Hawaii Legislature, in 1961, authorized a statewide survey of higher education. This survey was conducted by a team from the U. S. Office of Education, Department of Health, Education, and Welfare (HEW). The report of this study, among other matters, contained the recommendation that a system of community colleges be established.[1]

The 1963 Legislature appropriated funds and authorized the University of Hawaii to study plans for a Statewide Community College System (Act 201). The House of Representatives adopted a resolution requesting the University to develop a plan and submit its findings to the Legislature prior to the beginning of the budget Session of 1964 (H. R. 245).[2] The Legislature, during the 1964 Session, passed Act 39 (the Hawaii Community College Act) which authorized the University of Hawaii to create community colleges (except on the island of Hawaii) and "to provide for the inclusion of the technical schools of the department of education in such community colleges, as they are planned and established."

The purposes of Hawaii's community colleges are defined in Act 39 as follows:

> . . . to provide two-year college transfer and general education programs; semi-professional, technical, vocational, and continuing education programs, and such other educational programs as are appropriate to such institutions.

Subsequent action by the Legislature[3] provided an appropriation for the purpose of planning the first two colleges in the system -- one on Maui and the other located in Leeward Oahu.

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[1] Martorana, S. V., and Hollis, Ernest V. The University of Hawaii and Higher Education in Hawaii, a report of a survey; U. S. Office of Education, Department of Health, Education, and Welfare; Washington, D. C., 1962.

[2] The report, Feasibility of Community Colleges in Hawaii, by Richard H. Kosaki, was submitted to the Legislature on February 1, 1964.

[3] Act 52, Session Laws of Hawaii 1964.

The State of Hawaii, then, is to have a system of community colleges operated by the University of Hawaii, and financed, for the most part, from state appropriations. Tuition income from students may also be a source of operating revenue, but if the community colleges are to be truly the "people's colleges," tuition will have to be kept low, preferably at a figure not more than 75% of the University of Hawaii tuition, nor more than one-third of the per-student annual operating cost, whichever is less.

Even as the raison d'être of a college is the instructional program, the framework on which that program is built is the curriculum. Curriculum development is then the advance guard for the educational effort to follow. Based on the writer's consultations over a two-month period, plus a review of recent educational research studies and economic planning data for the State of Hawaii, some rough guidelines for curriculum development will be presented.

The Five Functions of a Community College. From the fifty-year development of the public junior college there has emerged a consensus as to the major functions of these institutions. They are:

1. To provide programs of two years or less duration, in as many occupational fields as local, regional, and national needs would indicate. These programs ordinarily range from the service occupations through the highly skilled, technical, and semi-professional occupations.
2. To provide lower division, college-parallel programs whose quality is such that successful completion of the curriculum will enable the transfer student to continue work toward the baccalaureate degree, without appreciable loss of credits, at a university or four-year college.
3. To provide a comprehensive and carefully organized program of guidance, counseling, and placement,along with other student services to the end that students may make realistic educational and career choices.
4. To provide a program of education for adults of the community, including curriculums leading to the associate degree as well as short-term programs for professional improvement and job-upgrading, and courses for those who desire to improve their general education attainments.
5. To serve as a focal point or center for a wide variety of activities related to the educational, economic, and cultural development of the community.

All five of these functions will be discussed in this report. The present chapter deals with the first function listed -- occupational education.

Occupational Education in Hawaii's Community Colleges. There are three approaches for developing a rationale for curriculum planning for community college occupational education.

1. Conduct a community occupational survey[1] and identify the needs of agriculture, business, industry, and government for workers in the middle manpower occupations. Using these manpower needs as a guide, plan curriculums and courses which will lead to occupational competence in the job fields for which a need has been determined. This is the "local needs" approach.
2. Recognize that in this era of geographical and occupational mobility, regional and statewide manpower needs, and also national needs are the proper concern of local educational agencies. If satisfying careers and good jobs are available anywhere in the nation (or on foreign assignments) a good case can be made for providing local youth and adults with education and training for these jobs. This is the "national needs" approach.
3. The third approach to curriculum planning is to utilize the essential features of the first two -- combining the results of a community occupational survey with information on manpower needs of the state and the nation. The interests and aptitudes of students can then be matched against manpower needs, and curriculums developed accordingly. This is the "student needs" approach, and is the rationale here recommended for curriculum development in Hawaii's community colleges.

Local Needs. Based on the writer's observations of local conditions, some tentative recommendations will be made for curriculum development at each of the five campuses currently under consideration -- Maui, Leeward Oahu, Honolulu Tech, Kapiolani Tech, and Kauai. These will be dealt with in Chapter III and should be regarded as tentative only, pending the completion of community surveys in each of the attendance areas.

National Needs. The national manpower situation is under continual study by such agencies as the U. S. Department of Labor, the U. S. Office of Education, the National Science Foundation, the U. S. Chamber of Commerce, the National Institute of Health, the U. S. Department of Agriculture, the Commerce Department, the U. S. Employment Service, and others. Community college curriculum planners will avail themselves of all the information (in the form of annual and periodic reports, special survey reports, and newsletters) emanating from these sources. There is no need for a review of these needs here.

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[1] See Chapter IV for a discussion of the community occupational survey.

Regional and Statewide Needs. Community college planners can keep themselves informed about these needs by:

1. Maintaining close working relations with the various state, federal, and private business agencies whose responsibilities include study of economic and manpower problems in Hawaii. For example:
    a. The State Department of Planning and Economic Development.
    b. The State Department of Labor & Industrial Relations
        - Employment Service Division.
        - Apprenticeship Division.
    c. The State Department of Personnel Services.
    d. The Federal Civil Service Commission.
    e. The personnel departments of the Navy, Army, and Air Force.
    f. The several Chambers of Commerce.
    g. The labor unions.
    h. The Department of Business Research of the Bank of Hawaii.
    i. The Department of Economic Research of the First National Bank of Hawaii.
    j. The Legislative Reference Bureau of the University of Hawaii.
    k. The Economic Research Center of the University of Hawaii.
    l. The Hawaii Visitors Bureau.
2. Conducting broad-based occupational and community surveys and relating the findings of these to data available from sources under (1) above.

Economic Indicators. Hawaii's present economic structure is based on four cornerstones -- federal expenditures for the military, tourism, sugar, and pineapple. Consultations with government officials, economists, business and industry leaders and University researchers on the subject of the growth prospects of these four "mainstays" of the economy reveal a consensus, as follows:

1. Military expenditures in Hawaii, for the next ten-year period, may increase as the nation directs a much larger share of its defense effort to the growing threat of Communist China. Such an increased effort would mean rising levels of employment in Hawaii's service industries, in shipping and distribution, and in occupations in the highly-skilled, clerical, and technical categories, to support the increased military effort.
2. Tourism, with its emphasis on hotels, resorts, air travel, and recreation facilities is expected to grow at a steady and rapid rate over the next decade. These opinions are predicated on continuing affluence throughout

the nations bordering the Pacific, and even minor economic recessions could militate against such growth. However, optimism is encountered everywhere throughout the state on this matter, and although Oahu is now the acknowledged center of the tourist industry, developments on the neighbor islands are proceeding rapidly. Hotel rooms in 1964 totalled 11,400 (compared with 1,572 in 1946) and the projections for the early 1970's run as high as 20,000.[1]

Employment needs of the hotel and restaurant industry are equated at one new employee for every new hotel room, so a big education and training job lies ahead to provide competent workers for the anticipated growth of tourism. The construction of 9,000 new hotel rooms (and associated restaurants and other service facilities, including improved airports, etc.) will necessitate a sharp increase in the number of skilled building trades workers also.

Banking, finance, and business services will have to expand to serve the needs of a tourist industry growing at such a rapid rate, and many new job openings for clerical and kindred workers will result.

3. The sugar industry, although both tonnage production and market value of product are increasing slightly, shows no indication of marked growth; and as far as employment potential goes the trend may well be down instead of up. Two factors are worthy of note however:
    a. The average age of sugar workers is quite advanced, and new hires due to retirements may be significant during the next decade.
    b. The primary need is for workers in highly-skilled and technical categories, although office workers will be needed also. Mechanization (and,to some extent, automation) of processes is proceeding apace, and job opportunities for unskilled workers are diminishing.
4. The pineapple industry seems to be one in which little employment growth can be expected. As urbanization proceeds, some pineapple lands are becoming subdivisions. Tonnage and dollar volume are holding up well, but increases in total employment are not envisioned. Mechanization in this industry has also displaced the unskilled worker. Many semi-skilled workers are still needed however, especially in the canneries. Replacement of retiring workers is a factor in this industry also.

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[1] Hawaii Visitors Bureau estimate.

A Look to the Future.[1] Economic planners in both public and private agencies are "thinking out loud" about all of the following possibilities, to supplement the "big four" discussed above. To the extent that any or all of these ideas become realities in the years ahead, programs of education and training may be indicated in the state's community colleges.

1. A planned effort is underway to attract "light industry" to Oahu. If successful, skilled and technical workers may be needed in increasing numbers.
2. A diversification of Hawaii's agriculture is envisioned,[2] with a probable doubling in the market value by 1975. Fresh pineapple, bananas, papayas, mangoes, blended (exotic) fruit juices, fruit salads, orchids, and other flowers, may all combine to become a significant factor in Hawaii's economy. If these developments occur, the community colleges may well introduce agri-business and horticulture programs, and possibly animal husbandry and poultry programs.
3. The idea that Hawaii can become the "bridge" between the Orient and the South Pacific on the one hand and the mainland U. S. and western Europe on the other is being explored. Hawaii-based contractors can do much of the construction work in the south- and west-Pacific areas; Hawaii ports can serve as trans-shipment centers for raw materials and finished products; the East-West Center at the University of Hawaii can provide the setting for a melding of philosophical, scientific, cultural, and business interests of the nations of the Pacific basin; Hawaii can become the financial and investment center for the Pacific -- these and other possibilities are getting a great deal of attention from persons in the forefront of planning for Hawaii's future. Any or all of these developments would create a need for "middle manpower" workers.
4. There is hope for increased scientific and technical research in Hawaii. A portion of such activity may be related to the military and space effort, but much of it might be concerned with tropical agriculture and

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[1] A portion of this section is based on analyses by the Department of Business Research, Bank of Hawaii, in its 1964 Annual Economic Report.

[2] See predictions of Thomas Yamabe, executive secretary of the Farm Bureau Federation, as quoted in Honolulu Star-Bulletin for November 19, 1964. Page 37.

food processing, oceanography, geophysics, health and bio-medicine, fisheries, volcanology, and like activities. The University of Hawaii will play a leading role in many of these activities. Although the direction of such research activities will require professional scientists, mathematicians, and engineers, these must have the support of many semi-professional technicians. Hawaii's community colleges can provide the technical personnel required for these research activities as they increase year by year.

Broad Fields of Occupational Education Needed in Hawaii's Community Colleges. Based on the above brief analysis of Hawaii's current and projected economy, and also on the nation's manpower needs, some broad outlines of a curriculum structure for Hawaii's state system of community colleges will now be drawn. Some of the curriculum areas listed might be represented at all of the community colleges, while some might be found at only one or two of the colleges. These details will be discussed further in Chapter III.

Since the listings below are all related to occupational (i.e., one- or two-year terminal) programs, it should be mentioned at the outset that all of the colleges should also provide a program of lower division liberal arts, sciences, and pre-professional studies leading to transfer and later graduation from a four-year college or university. These programs would be closely matched to the lower division requirements of the University of Hawaii, but attention should also be given to the requirements of mainland colleges and universities to which significant numbers of students may transfer.

Broad Occupational Fields (and Sub-Fields) Suggested for Community College Educational Programs:

1. Agricultural occupations
    a. Agricultural technology
    b. Agri-business
    c. Horticulture and floriculture
2. Business occupations
    a. Secretarial (several levels)
    b. Accounting (two levels)
    c. Business management (several options)
    d. Retailing and store management
    e. Data processing (two options)
    f. Finance, insurance, and real estate
    g. Sales and advertising

3. Technical and scientific occupations
    a. Civil technology
    b. Electronics technology (several options)
    c. Instrumentation technology
    d. Science laboratory technology
    e. Drafting and design technology
    f. Refrigeration and air conditioning technology
4. Industrial occupations
    a. Auto and diesel trades (several options)
    b. Building trades (several options)
    c. Electricity and appliance repair
    d. Machine trades and heavy-equipment maintenance
    e. Aircraft mechanics (two options)
    f. Apparel trades (two options)
    g. Refrigeration mechanic
    h. Welding
    i. Service station operation
    j. Apprenticeship programs (in cooperation with local unions and with military bases)
5. Service occupations
    a. Barbering and cosmetology
    b. Hotel and restaurant occupations (several options)
    c. Commercial baking
    d. Cafeteria management
    e. Tour guide training
    f. Law enforcement
6. Health occupations
    a. Registered (associate degree) nursing
    b. Practical nursing
    c. Dental office assistant
    d. Medical office assistant
    e. Medical laboratory technician
    f. Dental hygienist

Summary

It is again emphasized that the above listing applies to the system of community colleges as a whole, and does not mean that each college should have all these programs. Furthermore, it is not intended that all the above programs shall be initiated immediately. Carefully conducted community occupational surveys, along with data from state and national manpower needs surveys, should be used to justify the establishment of each new program. Student interests and needs in each attendance area must also be evaluated in deciding on the eventual list of curriculums offered. Further discussion, with suggestions for each campus, will be given in Chapter III.

Chapter III

SUGGESTED EDUCATIONAL PROGRAMS ACCORDING TO CAMPUS LOCATION

It has been pointed out in a previous section that all programs recommended for the state as a whole will not necessarily be offered on all campuses. Some differentiation of function between campuses will not only be necessary, but desirable. This chapter will make proposals on curriculums to be considered for each of the five campuses being proposed.

A prior word about the five probable campuses is in order. Presently, planning money is available only for campuses on Maui and at Leeward Oahu, and these two institutions are to be brought into being as soon as is prudently possible, perhaps in 1966 or 1967. The transition of Honolulu Tech and Kapiolani Tech to community college status awaits administrative action and legislative appropriations, but may be effected by 1968. No timetable has yet been proposed for Kauai, but it is probable that its conversion to full community college status would not be possible until 1969 or 1970. Since no names have as yet been suggested for the new colleges, the present terminology (i.e., Honolulu, Kapiolani, Leeward, Maui, and Kauai) will be used in the following analysis. A rough (suggested) timetable of activities is included, as a guide to administrative planning.

It is emphasized that a community occupational survey should be completed for each county before or during the curriculum development process. For Maui and Kauai these surveys will be relatively simple, but for Oahu the survey will be a job of considerable magnitude, requiring the full cooperation of business, industry, labor, agriculture, the federal and state governments, the military, the schools, and the University of Hawaii. A full-time director and survey staff will be needed for the Oahu project and a survey budget of some $30,000 will probably be required. At least six months' time will be needed to complete a survey of this magnitude.

The suggestion has been made that the University assume the operation of all the technical schools (except Hawaii) on July 1, 1965, and the writer recommends strongly that this action be taken. In the separate discussions below, the "timetables" start from that date.

MAUI

Based on a four-day visit to Maui Technical School, the general impression is that of a well-managed school with an efficient but inadequately financed instructional program. The school is serving the post-high school vocational education needs of Maui as well as it can under present financial and curriculum limitations. Most of the buildings are in good condition and could be used as the institution becomes a community college. The present site is much too small and at least 30 additional acres should be acquired in order to meet the long-term needs of the Maui Community College. It is recommended that the present curriculums and courses be maintained throughout the 1965-66 academic year, but that evaluations of all these programs be made during the year to determine whether each should be retained as is, changed materially, or perhaps be dropped.

Curriculum Development Timetable (Maui Community College)

1965-66 --

1. Operate as a technical school with essentially the present curriculum.
2. Conduct community survey.
3. Appoint director and necessary administrative assistants, including counseling and guidance personnel. (Director to be appointed during 1965-66 school year.)
4. Plan for the initiation of a core of general education courses which will make the associate degree possible (see Chapter IV).
5. Organize guidance and placement services.
6. Plan time and schedule changes to permit shifting from a clock-hour basis to a credit-hour basis -- to take effect in September, 1966.
7. Begin architectural planning for the first units of the new building program.
8. Establish close liaison with high schools of the county.

1966-67 --

1. Enroll entering freshmen in the newly planned associate degree sequences. Allow second year students to finish under the old plan (without degree), or to meet degree requirements via summer session or by returning for an extra semester, if they so desire.
2. Establish the college curriculum committee (see Chapter IV).
3. Plan for lower-division liberal arts, sciences, and pre-professional courses for the college parallel program. Recruit faculty for same, to be employed for the 1967-68 year.
4. Prepare college bulletin and other informational materials. Start working on liaison with the high schools of the county.
5. First units of new building program to be completed for September, 1967 occupancy -- science labs, library, a classroom building, and administration-student services facilities.

6. Plan for two levels of secretarial training, to wit:
    a. Clerk-typist major (skilled level).
    b. Secretarial major (semi-professional level).

   Begin these in September, 1967. Both should lead to the Associate Degree.

7. Plan for a curriculum in Business Management, to be initiated in September, 1967.

8. Plan some advanced and specialized courses for the more able auto mechanics majors, for example:
    a. ignition and carburetion
    b. automatic transmissions
    c. garage operation

   Begin these in September, 1967.

9. Make a thorough study of the feasibility of a registered nurse (associate degree) program, to be operated in cooperation with the Maui County Hospital. If feasibility is established, plan for initiating the program in 1968-69.

10. Do the necessary planning to up-grade the existing "Drafting -- Building Trades" curriculum into an Architectural Drafting (semi-professional) curriculum.

11. Consider the feasibility of a home economics program.

12. Study the existing machine shop, welding, and sheet metal curriculums in detail to determine whether they should remain in their present form. A "spot survey" of job opportunities and placements in these fields might be indicated. Give consideration to a program specifically aimed at heavy equipment maintenance and repair.

13. Plan next unit(s) of building program (theater, drama, arts?)

14. Recruit and employ (for September, 1967) a dean for the liberal arts program.

15. Recruit and employ (for September, 1967) a dean for the applied arts and sciences.

1967-68 -- 1. Shift to community college operation. Initiate the freshman courses for the lower division transfer program in the liberal arts, sciences, and pre-professional fields, under the leadership of the new dean of liberal arts and sciences.

2. Initiate the changes indicated from the results of studies conducted in the previous year.

3. Reorganize occupational education programs under the new dean of applied arts and sciences.
4. Conduct spot surveys to determine possible need for programs in the following fields:
    a. Hotel and restaurant occupations
    b. Agriculture (two or three specialties)
    c. Engineering technology
    d. Evening classes for adults -- apprenticeship programs
5. Graduate first class with associate degrees.

1968-69 -- 1. Full operation as a comprehensive community college.
2. Graduate first group of transfer students.
3. Develop the evening college program.
4. Complete the music, drama, and arts building.
5. Develop the college's program of community services -- forums; music, drama, and art festivals; symposiums; community needs conferences; extension courses from the University of Hawaii.

LEEWARD OAHU

This is to be an entirely new campus serving an attendance area of some 100,000 population residing in that portion of Oahu lying to the west of an imaginary line drawn between Aiea on the east edge of Pearl Harbor to Kawela Bay on the north shore of Oahu. Most of the military installations on Oahu lie within this attendance area. Much of the sugar cane and pineapple industry is also contained within these boundaries. The Campbell Industrial Park with its developing complex will be served by this campus.

The Leeward curriculum will be developed without an already established base, and both advantages and disadvantages are inherent in this situation. The advantages center around opportunities for innovation unhampered by tradition and the stultifying effect of "status quo" thinking. The disadvantages relate to the absence of data on which intelligent projections can be made.

Very little of real significance can be accomplished in planning Leeward's curriculum until a community survey is completed for Oahu. The format and information retrieval scheme for this survey should provide for an easy separation of the data applicable to the Leeward attendance area. This survey of Oahu is one of the very first projects for which funds should be sought.

Curriculum Development Timetable (Leeward Oahu Community College)

1965-66 --

1. Appoint director and necessary administrative staff for initial planning. Director to be appointed during 1965-66 school year to take charge of campus planning.
2. Procure site and retain architects -- begin campus design.
3. Conduct the Oahu community survey. Results to be available by March 1966, so that curriculum plans can guide final architectural planning. Estimated budget for this complete survey -- $30,000.
4. Begin recruitment of faculty.

1966-67 --

1. Campus design completed and construction started.
2. Organize the college curriculum committee.
3. Organize guidance, counseling, and placement services.
4. Employ deans for applied arts and sciences, and for liberal arts and sciences.
5. Establish close liaison with all high schools of the attendance area.
6. Prepare college bulletin and other informational literature.
7. Recruit and employ faculty for full operation in 1967-68.
8. Construction of new campus to be completed by August, 1967.
9. Begin offering evening courses for adults for job-upgrading. Establish apprenticeship programs with the major military bases.

1967-68 --

1. Begin operation on new campus. Although it is impossible at the present writing to predict with any degree of objectivity what the curriculum at Leeward should be nearly three years from now, the following very tentative suggestions are made, based on the writer's two-month inquiry into the post-high school educational needs of Oahu.

The Occupational Education Program -- Leeward Oahu

1. General education courses in English, social studies, mathematics, psychology, speech, etc. at a non-transfer level for employment-bound students.[1] In addition, some very low-level English and mathematics offerings (perhaps 9th-grade level) might be required as a part of a freshman core for students with very poor high school records.
2. Supporting technical courses of an applied nature (non-transfer) in such fields as science, mathematics, drafting, technical writing. (See Appendix II.)

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[1] Brief descriptions of such courses are in the Appendix.

3. Two-year, associate degree programs in some or all of the following fields.[1]
    a. Agriculture (perhaps two options) if Oahu survey so indicates.
    b. Business education
        1. secretarial (two levels)
        2. accounting and business management
    c. Home economics
    d. Technical education
        1. civil technology
        2. electrical-electronics technology
        3. science laboratory technology
        4. drafting and design
        5. instrumentation (perhaps two levels)
    e. Trade and industrial education[2]
        1. auto trades
        2. metal trades (machine shop, welding, sheet metal)
        3. heavy equipment maintenance
    f. Apprenticeship program in conjunction with Navy, Army, Air Force training programs; and with local unions.
    g. Evening College program -- a wide variety of courses for job-upgrading in many fields, and also for liberal arts and general education.

The College-Parallel Program -- Leeward Campus

1. Liberal arts sequences of courses designed to qualify students for junior standing at the University of Hawaii.
2. Pre-professional lower division sequences in:
    a. Business administration
    b. Engineering
    c. Science and mathematics
    d. Education

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[1] Extreme care should be used in phasing in new curriculums. Plan carefully and allow the program (and the facilities) to grow slowly. A comprehensive community college develops over a period of years, and is not full-blown overnight.

[2] Caution is suggested here. Phase these programs in as evidence accumulates that facilities of the Honolulu Tech campus cannot cope with student demand for the entire county.

3. Sequences and levels of courses designed to "salvage" students whose prior preparation is such that they are not ready to begin the "regular" college-level transfer courses. These might include English, mathematics, and reading improvement courses.

CAMPUSES IN HONOLULU

The two technical schools in Honolulu both have excellent programs in many vocational fields. Each has some very good buildings and facilities, and some inadequate and very poor facilities. The possibility exists at Honolulu Tech of acquiring a large enough site to develop a community college of some 2,000 students[1] which might continue to emphasize trade and technical education within a more comprehensive framework than now exists there. The present location of Kapiolani Tech offers little possibility for expansion and this site is judged inadequate in size for the development of a comprehensive community college of perhaps 3,000 students.[1]

Despite the rather considerable investment on both of the present sites, it is at least within the realm of reason to consider disposing of both campuses, and acquiring a completely new and adequate site which will combine these two institutions into one large, comprehensive community college for Honolulu. Some factors supporting such a plan are:

1. Kapiolani will have to be moved in any event.
2. The possibilities for additional land acquisition at Honolulu Tech leave much to be desired. Even if all of the land "possibly" available could be acquired the site would still be too small.
3. A single student body (even though it might reach 7,000 students in a decade) on one campus with a real college atmosphere is to be preferred over a separation of students into the "trade-tech" group on one campus, and the "business-health-college prep" group on another campus. Gradually, the "college prep-business-health" campus would tend to become the status institution, and the trade-tech campus may be held in relatively low esteem by parents and high school students alike.
4. Duplication of many facilities (library, administrative offices, student services offices, certain laboratories) could be avoided.

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[1] Enrollment projections from Supplementary Data to Report entitled, Feasibility of Community Colleges in Hawaii; University of Hawaii Community College Study Project, Honolulu, 1964.

5. A saving on administrative costs would result. Also, savings on campus maintenance and custodial services would be probable.
6. The desired student-faculty ratio of 20:1 would be much easier to attain.

On the other hand, the obvious disadvantages to such a plan are:

1. The possibility of significant financial losses on existing capital investment.
2. The very real difficulty of finding a suitable site for the single Honolulu Community College.

In spite of these admittedly serious difficulties it is the recommendation of the writer that every possible effort be made to combine Honolulu Tech and Kapiolani Tech into one large comprehensive community college to serve metropolitan Honolulu and the eastern side of Oahu. Within a decade, *if growth demands it*, a third Oahu campus could be located in the Kaneohe-Kailua area to serve Windward Oahu. The following timetable is suggested if the plan for a single campus were to be adopted.

Timetable for Honolulu Community College -- Single Campus

1965-66 --
1. Operate both institutions with their present programs at their present locations.
2. Acquire site for the Honolulu Community College campus.
3. Conduct community survey of Oahu.
4. Plan for a general education core of courses which would permit programs at both Kapiolani and Honolulu to meet associate degree requirements. These to be added in September, 1966.
5. Plan to phase out the clock-hour schedules and phase in the credit-hour plan -- to take effect September, 1966.
6. Recruit and employ additional faculty as needed for the general education courses.
7. Set up and staff the guidance and placement program.
8. Establish close liaison with all high schools.
9. Prepare new bulletins and descriptive literature on associate degree programs.
10. Plan for expanding the evening (adult) and apprenticeship programs. Employ a full-time apprenticeship coordinator to work with labor and management groups for the expansion of these programs.

1966-67 --
1. Begin the new schedule and the associate degree programs at both campuses. Allow second year students to choose between graduation under the old plan or fulfilling requirements for the associate degree.

2. Employ a director for the proposed single campus, and also deans of applied arts and sciences, and liberal arts and sciences.
3. Initiate planning for college-parallel programs in liberal arts and pre-professional fields.
4. Appoint the college curriculum committee.
5. Engage architects and begin design of new campus.
6. Recruit and employ staff for the college-parallel programs.

1967-68 -- 1. Shift to community college status, temporarily operating two campuses, as follows:
   - a. Honolulu Tech to have essentially its present programs but to be operating on a college schedule within an associate degree framework. (Certain programs may remain "certificate" programs if desired.)
   - b. Kapiolani Tech to continue with its present programs, but re-cast into an associate degree scheme. (Some may remain "certificate" programs.)
   - c. Initiate the college-parallel program at Kapiolani Tech.

2. Let contracts for the construction and equipping of the new campus.
3. Recruit and employ additional staff as needed.

1968-69 -- Complete construction of new campus.

September 1969 -- Occupy new campus, and consolidate the two schools into one comprehensive community college.

Suggested Curriculum Changes and Improvements in Occupational Education Programs -- Honolulu Community College

The following suggestions are based on detailed analyses of the present operations of both Honolulu Tech and Kapiolani Tech. The recommendations should be put into effect as soon as possible whether the two institutions eventually merge or remain separate. The listed order is not necessarily an indication of priorities in time.

Suggested Changes for Honolulu Tech

Note: All of the programs should shift to a credit-hour basis starting September, 1966. Those programs which are organized on a two-year basis should be revised to include 15 to 20 credit hours of general education and 10 to 15 credit hours of supporting technical courses (applied science, mathematics, drafting, etc.) and should then lead to the associate degree.

Some one-year and short-term programs may be retained, which lead to a suitable certificate. During the transitional period students who started under the old plan would be allowed to graduate under that plan if they so desired.

1. Aircraft Mechanics (Engines and Air Frame)
    a. Conduct a thorough "spot" survey for this program. Determine the current needs of the industry. Make curriculum changes accordingly. More emphasis on modern (jet) engines is needed, and on current hydraulic systems and air frames.
    b. More theory courses should be taught, and classroom space is needed in which to teach them.
    c. Some new and modern equipment is needed.
    d. Consideration might be given to eventually offering ground school and flight training.
2. Auto Body Repair and Painting

   As currently operating this seems to be an excellent program. Allow students the option of degree plan or certificate plan, but encourage degree plan.
3. Auto Mechanics

   Currently well organized and operated. Re-cast it into an associate degree plan so that students will get supporting technical courses and general education. Retain present emphasis on realism in the shop -- actual garage operation.
4. Baking, Commercial

   Looks very good as is. Allow students option of associate degree plan or certificate plan.
5. Cafeteria Management

   Very good as is. Allow students option of degree plan or certificate plan.
6. Carpentry - Cabinetmaking

   A thorough re-study of the local industry is needed here. Is there any appreciable placement in cabinetmaking? Can the program be made more realistic? This one needs a great deal of study. Relationship with union needs clarification. Encourage an associate degree program.
7. Apparel Trades

   Seems a very good program, but suggest a "spot" survey of the industry to determine definite objectives. Allow students to choose between degree or certificate.

8. Cosmetology

Looks very good. Facilities need immediate improvement and probable expansion to accommodate more students. Allow students option of either the degree or the certificate plan.

9. Drafting, Building Trades

This program needs a complete shake-up. Reorganize the entire drafting program as follows:

   a. Establish the architectural drafting major at a semi-professional technician level leading to the associate degree.
   b. Explore the need for a similar two-year program in machine drafting.
   c. Emphasize the new "graphics" approach in a basic four credit-hour drafting course for all the trade-tech students.
   d. Offer specialized courses as follows:
      1. Electrical - electronics drafting
      2. Sheet metal drafting
      3. Blue-print reading

10. Electricity

Complete re-study needed. Facilities are very poor at present, and new lab-shop now being planned is much needed. "Spot" survey of local industry and cooperation of an active advisory committee are musts. Revised program might emerge along the following lines:

   a. A two-year pre-employment associate degree (semi-professional) program in electrical technology -- real depth in theory, machines, circuits, industrial power controls, production and distribution of electric power. Arrangements with union to allow credit on apprenticeship time should be made.
   b. An appliance repair program -- option of either degree plan or certificate plan.
   c. A pre-apprenticeship one-year program in elementary electricity and house wiring -- certificate level. Arrangements with union must be perfected.

11. Machine Shop

Complete re-study needed. "Spot" survey of local industry and cooperation of an active advisory committee essential. Much obsolete equipment needs removal and shop needs cleaning out and re-arranging. Some items of new, modern equipment are needed. Program might emerge as follows:

a. A two-year pre-employment associate degree program in machine trades -- theory, supporting technical courses, and general education -- with union agreement to credit the two years on apprenticeship period, if possible.

b. A heavy equipment maintenance program utilizing the machine shop, the welding shop, the electrical shop and the auto shop as laboratories. Take in actual jobs to work on. Allow students option of associate degree or certificate program.

12. Power Machine Operator (Garment)

Same comments as for (7) above.

13. Electronics

Re-study of objectives needed. "Spot" survey and local advisory committee should be used. The new electronics program might become somewhat like the following:

a. A two-year associate degree electronics technology program (semi-professional-technician level) with solid work in theory, vacuum tubes, transistors, circuits, instruments, and devices. Two or more sophomore options might work off the basic freshman core, as:

   1. Communications technician
   2. Industrial electronics technician
   3. Instrumentation technician (would include hydraulics and pneumatics also.)

   This program would include basic science and mathematics, supporting technical courses, and general education.

b. A radio-TV repair program at the trade level.

   Allow students to elect either a degree program or a certificate program.

14. Engineering Aide

Clarify the objectives of this program. A "spot" survey to determine need for engineering and science laboratory technicians should be made. A possible outcome might be the emergence of the following curriculums, both at the associate degree, semi-professional technician level:

a. Civil technology

b. Science laboratory technology

In order to offer these curriculums, and the others above referred to as "semi-professional technical", several new science, mathematics, and supporting technical courses will have to be offered, including:

a. Technical physics (one full year, with laboratory)[1]
b. Technical mathematics (four semesters -- through applied calculus and advanced topics)[1]
c. Strength of materials
d. Statics and mechanics
e. Engineering graphics
f. Technical chemistry (one full year, with laboratory)

Furthermore, a well-equipped engineering technology laboratory will be required.

15. Refrigeration and Air Conditioning

Thorough survey of local industry needed to determine availability and level of jobs. The objectives of the program need clarification. The shop needs a complete clean-up with much of the existing (obsolete) equipment and material disposed of. Then a planned program of purchases to outfit the shop with current equipment and realistic teaching aids should be carried out. It is probable that two levels of programs might eventually develop:

a. Refrigeration and air conditioning technology. An associate degree, technical level program for persons who will do estimating, design, sales, and installation of systems. These students should have a one semester course in sheet metal, with emphasis on duct work, and should take the core of basic courses required of all technicians.[2]
b. Refrigeration and air conditioning trades. A program whose emphasis is on trouble shooting and repair of existing installations. This would be a trade level program, and degree plan or certificate plan could be at the option of the student.

16. Sheet Metal

Looks like a good program as is, but mathematics requirements should be increased somewhat. A "spot" survey is suggested to check on the objectivity of the current offering. Is union cooperation all that it should be?

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[1] See materials in Appendix III.

[2] See suggested Core Curriculum in Appendix II.

Are students being placed as apprentices? Students could elect either the associate degree or the certificate program, but should be encouraged to take the associate degree.

17. Welding

This program should be a very good one as soon as the new building is available. Theoretical content should be increased, by requiring applied science, practical metallurgy, and technical mathematics. The associate degree program should be emphasized, but some students might be allowed to elect the certificate program. Also, see comments under 11(b).

Suggested Changes for Kapiolani Tech.

Shift to credit-hour plan in all instructional areas. All of the programs which are organized on a two-year basis should be revised to include 15 to 20 credit hours of general education and 10 to 15 credit hours of supporting technical courses (chosen to suit the student's specialty), and should then lead to the associate degree. One-year and short-term programs may lead to a suitable certificate. During the transitional period students who started under the old plan could be allowed to graduate under that plan if they so desired.

1. Clerk-Typist Curriculum

Satisfactory as is. This would be a one-year certificate program under the community college organization.

2. Clerk-Steno Curriculum

This one should be revised. A girl is either capable of becoming a competent stenographer or she is not capable. A proficiency of 100 w/m (shorthand) with some errors allowed is unsatisfactory. Recommend redesignating the curriculum as stenography, raise proficiency level to 120 w/m (shorthand); 60 w/m no errors (typing). Make it a two-year program with a revised curriculum leading to the associate degree. Exceptions to the two-year program might be allowed for girls with good skill levels from high school who would need only one year to reach the proficiency levels recommended above. In these cases a certificate might be awarded, but all should be encouraged to complete degree requirements.

3. Secretary Curriculum

This curriculum should be up-graded to semi-professional status and several options (legal secretary, medical secretary, technical secretary, bi-lingual secretary, etc.) should be offered. The proficiency requirements should be increased to 130 w/m (no errors) in shorthand, and 60 w/m (no errors) in typing. The new program should contain strong English content (three or four semesters), and at least one-fourth of the total credit hours should be in general education. The objective here is to graduate top-flight, well-educated young women capable of becoming private secretaries.

4. Account-Clerk Curriculum

   Should be studied with a view to clarifying its objectives. Its present level hardly justifies the term "accounting." Perhaps it should be recast in a one-year (two semester) pattern leading to a certificate. Consideration should be given to re-naming it Bookkeeping.

5. Accounting Curriculum

   Needs some revision to up-grade it to semi-professional, associate degree status. Decrease the amount of time devoted to typing, filing, duplicating machines, etc., and incorporate a core of general education and supporting technical (i.e. business) courses totalling some 30 credit hours out of about 66 required for the degree.

6. Dental Assistant Curriculum

   Should be up-graded to two-year semi-professional associate degree status, in accordance with the curriculum recommended by the American Dental Association. The extra year can provide for additional in-depth training in office and dental chair skills and for general education, including applied science. A new laboratory with five more dental office set-ups is needed as soon as possible.

7. Practical Nursing Program

   Satisfactory as is. Retain it as a one-year certificate program.

8. Hotel and Restaurant Program

   The four specialties now offered -- commercial cooking, pantry, storeroom and cost control, and dining room service -- are satisfactory as they are now offered, and may be continued on a certificate basis. It is recommended that a new associate degree program at the management level be added for those more capable and mature students who ought to be considering management careers.

Problems Involving Both Honolulu Tech and Kapiolani Tech

1. Both campuses should give immediate attention to the whole matter of guidance, counseling, placement, and student services in general. Both should begin the development of adequate library services. (Kapiolani's library is already fairly good.)
2. Both should undergo schedule revisions to put them on a credit-hour basis instead of a clock-hour basis. This will mean teaching loads (i.e., actual classroom teaching) of from 15 to 25 hours per week instead of 30 to 40 hours per week. Additional faculty will probably be required. A student-to-faculty ratio of 20 to 1 should be the objective. An in-service program of faculty education will be necessary in order that they will use this "new-found" time professionally.
3. Both need increased budgets for modern equipment, increased library holdings, and (for some programs) new buildings.
4. Both should establish functioning curriculum committees with broad-based faculty participation, as soon as possible.
5. An in-service education program for faculty members should be instituted as soon as possible. One objective of such a program would be to acquaint teachers with the community college philosophy and the different (and additional) kinds of professional effort which will be required of them as college faculty members. Each could then decide whether or not he desires to move into the community college activity, or request transfer to the public schools.
6. The whole problem of differentiation of function is a troublesome one if the campuses remain separate, but here are some recommendations, if they do remain separate.
    a. Kapiolani retains the business education, the nursing, and dental office assisting.
    b. Honolulu retains all the industry-related vocational education.
    c. Consideration needs to be given to the problem of the hotel, restaurant, and foods service programs. Some of these foods-related programs are now at each campus. Eventually, it should all be on one campus, in one instructional division, under one chairman. This is not an urgent matter, but one to consider as a new campus is being built, either for Kapiolani, or for a single Honolulu Community College.

d. The health occupations program to be at Kapiolani. Put registered (associate degree) nursing, practical nursing, dental office assisting, and any new programs (medical office assisting, medical lab technician, etc.) in a single division under a division chairman.

e. The college-parallel program to be at Kapiolani. Liberal arts courses, sciences, humanities, the arts, and pre-professional courses. Lower division sequences in business administration; engineering, science, and mathematics; pre-teaching, etc. will all be on this campus.

f. The question of the engineering technologies is a particularly troublesome one. They have a direct relationship to science, mathematics, and engineering and their location at Kapiolani could therefore be defended. On the other hand, they also have a direct relationship to some of the trades, and instruction in shop work is a part of the curriculum for most of the technologies. A location at Honolulu Tech would facilitate this phase of these programs for engineering aides, instrumentation technicians, electronic technicians, architectural draftsmen, refrigeration-air conditioning technicians, data processing technicians, etc. If the campuses are separate, two alternatives present themselves, neither of which is very desirable.

    1. Students would commute between campuses, taking theoretical and supporting technical work at Kapiolani and shop work at Honolulu Tech, or
    2. Laboratories and classrooms (and instructors) for applied science, engineering, mathematics, and general education courses would have to be provided on both campuses, in order that technology students could take all their work at Honolulu Tech. This alternative is very undesirable since it would put the engineering technician programs (and students) on a different campus from the pre-engineering (transfer) programs and students.

Suggested New Programs for Kapiolani

1. Home economics (general education emphasis) by 1968
2. Data processing (by 1968)
3. Law enforcement (by 1968)

4. Computer programming (by 1970)
   The electronic technology phases would have to be taught at Honolulu Tech, however, if the campuses remain separate.

East-West Center Institute of Technical Interchange

Both campuses (or the recommended single campus) in Honolulu should plan cooperatively with the Institute of Technical Interchange, East-West Center, for the maximum possible use of their facilities and courses by students enrolled in the ITI program. (Campuses on the other islands may also be involved, but the major activity would probably be in Honolulu.)

In closing this section on the Honolulu development it is reiterated that, in the long run, the desirable development is to have a single, large campus, where a truly comprehensive community college can develop for this metropolitan area.

KAUAI

Kauai Technical School is efficiently operated, has some excellent facilities and some good instructional programs. Its major problem is lack of enrollment. A five-day visit on the island of Kauai provided a basis for some very tentative recommendations, as follows:

1. Take over Kauai Tech at the same time as the others -- July 1, 1965.
2. Operate it as a Technical School for the next three years. In the meantime give attention and planning effort to:
   a. Increasing the enrollment (why do so many Kauai students come to Oahu to attend technical school?)
   b. Identifying possible sites for a campus.
   c. A Kauai County community college survey -- to gather "hard" information on the potential for a comprehensive community college.
   d. Faculty in-service education.
3. Study present curriculums and placement of graduates, to determine whether all the present programs should be retained, or some consolidation be attempted.
4. Add enough offerings in general education so that students who so desire may qualify for the associate degree by 1968. Require the associate degree sequence for certain programs in business and technical fields.
5. If studies indicate an assured enrollment of 350-400 by 1970, begin some college-parallel work in the liberal arts on the present campus in 1967.

If enrollment reaches expectations (400), add (temporary) science laboratories in 1968.

6. Based on the experience up to 1968 it might be feasible to begin planning in 1968 for a new campus for September 1970 occupancy.
7. A major problem for a proposed community college on Kauai will be the "status" factor. Images can be changed to some extent by public relations techniques, but most important of all is the quality of the faculty. As the opportunity arises to add new members, particularly those who will teach the general education and college-parallel work, no effort should be spared to attract top quality people.
8. At the present time, no specific recommendations can be made for new occupational education programs, since there is hardly enough enrollment to justify some of the programs now operating. A thorough community survey, conducted with widespread citizen participation, is necessary, before changes, additions, or deletions could be recommended.

HAWAII

The island of Hawaii was excepted from the community college law (Act 39). This decision seemed to have been influenced by two assumptions:

1. The University's Hilo Branch is taking care of lower division college needs.
2. The Hawaii Technical School is meeting the Big Island's needs for occupational education.

Both of these assumptions should be examined rather carefully. First, it should be remembered that the Hilo Branch has the same entrance requirements as the Manoa Campus, and consequently many students who need the "second chance" offered by a community college are not being served. Second, the Hawaii Technical School operates a vocational program at the trades and service occupations level, and the entire semi-professional-technician area of education is not being touched. Taken together these two neglected functions might well involve 300 students per year on Hawaii. Third, the operation of two campuses, both with small enrollments, is not economical in terms of unit costs.

It is the strong recommendation of the writer that the 1965 Legislature reconsider the matter and include Hawaii in the State Community College System. The youth of the Big Island deserve the same educational advantages that will be available to young people in the rest of the state.

Chapter IV

CURRICULUM DEVELOPMENT FOR OCCUPATIONAL EDUCATION

The previous chapter discussed some of the occupational education and training curriculums now being offered at Hawaii's technical schools, and recommended some revisions, combinations and additions, together with a suggested time schedule. It should be reiterated that all of these observations are tentative indeed, having been based upon relatively brief studies of the proposed attendance areas (four days each on Maui and Kauai, for instance).

Realistic curriculum development takes much time and effort, and should be based on four essential factors -- (1) a community survey, (2) cooperative faculty action, (3) the assistance of knowledgeable lay advisory committees, and (4) capable administrative leadership.

Each of these factors will be dealt with briefly, and then some sample curriculums will be presented which have relevance to the Hawaii community college system.

COMMUNITY SURVEYS

Recommended Nature of the Survey.[1] Surveys conducted to study questions pertaining to educational problems may be organized and conducted in at least two ways. A staff of technical experts may converge upon a community, raise questions among themselves regarding the problem, obtain information, analyze and interpret the findings, draw conclusions, and "hand down" recommendations to the cognizant authorities. Authorities then proceed to determine which recommendations would be best for the community and attempt to acquaint the people with them for the purpose of gaining support for action on the matters which have been determined "best" for them. The central task for getting favorable action on recommendations following such a study is for a few people to "sell" the uninformed on what is "best."

The other way is for a staff of consultants to work with persons representing every part of the local area. They work together in raising pertinent questions, determining which types of information are essential, deciding upon procedures for obtaining information, analyzing and interpreting data after people in the community have helped obtain the information, and in formulating conclusions and recommendations for action. This is the type of survey which the writer supports because of its many advantages and long-range values to the people of a community. This type of a survey is an educational process by which large numbers of local citizens and taxpayers become familiar with facts regarding the local situation. The result is that they know what is needed for improving educational opportunities and why. It is recommended that the organization and conduct of local surveys in Hawaii be such that citizens participate fully in each effort.

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[1] Much of the discussion in this section is adapted from material prepared by Professor Raymond Young of the University of Michigan in directing surveys for the establishment of community colleges in the Midwest.

Proposed Relationships of Various Groups. In a large complex undertaking such as a comprehensive community college study, it is essential for efficiency of operation that proper relationships among the several groups and individuals be developed and understood. This is necessary to establish effective channels of communication, to avoid unfortunate misunderstandings which otherwise inevitably arise, and to facilitate the work with dispatch. Following are suggested relationships which have proved to be most effective.

1. The Survey Director

   It is essential that every survey have a director to serve as general coordinator of the total survey. This responsibility must be centralized in one authority in a position to consider at all times every aspect of the total effort in initiating the survey, in coordinating activities of the several work sub-committees, and in keeping the survey work moving progressively toward a satisfactory conclusion. It is at this point that decisions are made regarding the specific activities involved in conducting the survey. The survey director will report progress periodically to the Community College System administration concerning the status of the survey. The survey director serves as the field coordinator of the survey, and receives written reports of the information and work of sub-committees. The director gives advice and counsel to and seeks advice and counsel from the central staff, and citizens committees, and the consultants or resource personnel.

2. University Consultants

   University and state planning consultants, because of their specialized knowledge and experience, should serve as continuing technical consultants to the work of the several sub-committees. Some of their major tasks are to raise pertinent questions, to suggest types of information to be obtained, and to offer advice concerning the techniques and procedures for obtaining information. They assist in the development or modification of instruments (such as questionnaires and interview guides) for obtaining information, and advise concerning procedures for using them. Consultants assist in organizing, analyzing, and interpreting information obtained by the work of sub-committee members. At appropriate times specialized consultant services are arranged for as the need arises concerning the work of individual sub-committees.

3. The Citizens Advisory Committee

   The Citizens Committee is advisory to the Survey Director. As such it possesses no legal prerogative or power. The major task of the Citizens Committee is ultimately to formulate and to pass recommendations to the Survey Director based on findings of its study. An equally important function of the Citizens Committee at all times is to keep the community accurately informed regarding the facts resulting from the study and to bring to the survey effort the opinions, attitudes, ideas, and reactions of community members.

4. The Work Sub-committees

   Each member of the total Citizens Advisory Committee will become a member of one work sub-committee. The work sub-committees will each study a special aspect of the total problem and report the results of their findings to the entire Citizens group at periodic intervals. Sub-committees may receive help and advice on pertinent questions from the general group if the need arises. Each sub-committee will be assisted on a continuing basis by at least one consultant and may call upon other resource persons to assist with specialized phases of their work.

Guiding Principles for all Study Procedures. Following are some suggested basic principles to be used as guideposts for action by various sub-committees. They should be amended or expanded as necessary:

1. All committees should establish a calendar of tentative deadlines for completion of various assigned tasks in terms of target dates established for the entire study.
2. General meetings of all committees should be open to public attendance.
3. Progress and findings of all committees should be given continued publicity, excepting those conclusions and recommendations which should await approval

by the entire Citizens Advisory Committee prior to their release. For example, it is unwise to release any information with regard to possible site locations until final decisions have been made.

4. All work sub-committees should make full use of materials and information already gathered by other groups. Recognition of source should be used in the report.
5. Citizens cannot be expected to launch immediately into the survey without having the benefit of preliminary discussions and training.
6. Outcomes of the study will be of little value unless all citizens in the county come to feel that the results concern them.
7. Final reports of all surveys should be prepared, published, and given wide dissemination by the central staff of the Community College System.

Purpose of the Survey. The community survey should determine (1) the extent and nature of needs for education beyond the high school including occupational education and college-parallel work; (2) the specific needs for curriculums in occupational education at semi-professional, technical, skilled, and service levels; (3) the size of the potential student body; (4) the availability of an adequate site; and (5) the interest, willingness and predisposition of citizens to support and maintain a community college.

The survey should result in a final report, based on facts, to be submitted to the citizens in a County regarding the need for a community college and specific recommendations as to the program offerings.

Sample questionnaires for such a survey are included in the appendix.

COOPERATIVE FACULTY ACTION

College Curriculum Committees. Curriculum planning in a community college should involve a great deal of faculty participation. Ordinarily this is done not in faculty meetings, but by means of a continuing curriculum committee made up of certain key administrators (the president, deans, director of guidance, etc.) and faculty representatives elected from the various departmental or divisional groups. Continuity should be assured by having terms of at least two years, with "staggered" termination dates.

The curriculum committee may initiate changes itself; it may hear and act upon suggestions from the administration, the faculty at large, the students, or from lay citizens. It helps to plan complete curriculums as well as single courses; and (hopefully) it also has the courage to propose the elimination of curriculums and courses which have outlived their usefulness.

Its actions are quasi-official, and are forwarded to the president for review. In his capacity as campus administrator he may support or disapprove the committee action. In any event, the action, with his recommendation (or veto) attached, should be forwarded to the central administration of the Community College System.

Faculty participation in curriculum planning is extremely important for several reasons:

1. The faculty at large has a voice in planning through its representatives on the committee.
2. More ideas (both positive and negative) are available for critical evaluation.
3. Communication between instructional divisions, and between administration and faculty, is enhanced. The "we-they" complex is less likely to appear on campuses where the faculty shares in the planning.
4. Service on these committees is excellent experience for young faculty members and helps germinate the "seed corn" for future administrative talent.

LAY ADVISORY COMMITTEES

A community college should have a citizens advisory committee whose concern is with the overall development of the college as it functions within the community. This "overall" committee might meet only two or three times yearly and concern itself with advice and assistance on matters of importance to the college as a whole. It should be emphasized that advisory committees are just that -- advisory. They do not make policy. Only the governing board (in this case the central administration and the University Regents) can make policy. The "overall" committee might consist of nine to fifteen members chosen carefully from outstanding leaders in many fields -- business, industry, education, religion, agriculture, homemaking, labor, government, etc. Their appointments may be for four-year terms, with "staggered" dates to assure continuity.

Such a committee can, over the years, serve the interests of community college education in many ways, not the least of which is in interpreting the college and its programs to the citizens of the area.

In addition to this overall advisory committee, several (for large colleges, many) smaller lay advisory committees might function. These should be called into being to advise on specific phases of the college's occupational education program. Some might continue from year to year (with gradually changing membership); others might serve only during the planning period for a new course or curriculum and then be discharged. Many large community colleges have upwards of fifty or more such committees, meeting regularly to assist the college staff in planning and operating specialized educational programs. Advantages of using such committees include:

1. Realistic advice about job requirements and the demand for new workers in the specialized field.
2. Interpretation of the college programs to the community -- misunderstandings about the college are minimized.
3. Faculty and citizens become personally acquainted.
4. Contacts made at committee meetings frequently result in job placements for graduates of the program.
5. Occasional gifts of equipment, bequests for scholarships, or even a large gift to construct a major building, may result.

Guidelines for Use of Advisory Committees

1. Choose members carefully -- invite them to serve by official letter.
2. Call meetings only when there is work to do. Have a full (written) agenda, and prepare minutes of every meeting.
3. Provide for a citizen chairman with the college representative (dean or department chairman) serving as secretary.
4. Take follow-up action on every meeting.
5. Arrange for members of the committee to visit the college frequently -- preferably when classes in the field of their interest are in session. Get them and the students personally acquainted.
6. It should be clearly understood from the outset (a handout sheet at the first meeting) that advice and counsel will be sought from the committee, but that decisions and policy rest with the college administration and the University Regents.
7. When the committee's services are no longer needed, discharge it with a letter of appreciation to each member.

CAPABLE ADMINISTRATIVE LEADERSHIP

Administrative Decision-Making in Curriculum Development. Faculty members at the present technical schools feel that they have little to say about curriculum matters, and even less about budgetary matters. Whether this is true or not is beside the point -- they strongly *feel* this way and the situation has had a negative effect on the personal professional development of the faculty members. "Decisions are made in Honolulu, not here", is the consensus of the neighbor island technical school faculties in the matter of decision-making. The community college system should attempt to correct this situation.

A considerable degree of autonomy for each campus is recommended. Long-term goals and state-wide policies will have to be set up by the central administration to be sure, but within this framework each faculty should be allowed freedom of maneuver. It is suggested that line-item budgets not be required, thus encouraging innovation within the academic year. Some measure of budgetary control is necessary of course, but "nit-picking" budgetary restrictions almost invariably result in a "nit-picking" approach to educational problems.

The Decision-making Process. Curriculum proposals considered by the curriculum committee should be approved or disapproved by that body after a consideration of "approximate costs", both capital outlay and annual operating costs. If the proposal is approved by the committee, the president and his council of deans (including the business affairs officer) will then consider it, from the viewpoint of both educational desirability and fiscal feasibility. In the event that the proposal does not merit their approval, a complete explanation of the reasons involved should be made to the curriculum committee and to the faculty. If the proposal is approved and forwarded to the central office similar action should be taken there. Effective and continuous communication, up and down and across the structure of decision-making, will gradually bring about the feeling among faculty members that they are professional partners in the educational enterprise, and not merely teacher-technicians. Such a plan for faculty participation in decision-making will, it is hoped, put a stop to a practice which now seems all too prevalent -- that of teachers by-passing the formal administrative structure to get the direct ear of legislators.

CURRICULUM CONTENT

In shifting the technical schools to a community college plan of operation, a number of changes will be necessary. Clock-hour plans will shift to credit-hour plans (either semester-based or quarter-based) within the next year or two; some programs will be up-graded in the sense that increased theoretical content will be introduced; and all of the programs which lead to the associate degree will come to include a core of general education up to perhaps one-fourth of the total credit hours required for graduation. Short-term "certificate" programs should not be eliminated, and a gradual transition to associate degree requirements will be necessary in the two-year programs, in order that students already enrolled may finish their work under the "old" plan if they desire.

No attempt will be made here to suggest curriculum patterns for all of the possible occupational education programs which may be offered by the community colleges in the next several years. However, some general principles will be suggested, and a few selected curriculums will be arranged in course patterns to serve as models for the consideration of those who will direct the curriculum development effort over the next several years. The suggestions made are for two-year, associate degree programs.

Two categories of such programs are identified:

1. Semi-professional and technician programs.
2. Highly-skilled trade and vocational programs.

Content distribution in semi-professional technician programs should be planned somewhat as follows:

Table 4-1

Suggested Course and Semester Credit
Hour Requirements for Community College Curriculums
Semi-Professional (Engineering) Technicians

Divisions of the Curriculum and Suggested Courses	Semester Credit Hour Requirements (One credit for one lecture hour or for three lab hours)	
	Credit Hours	% of Total
Mathematics (technical)--covering algebra, geometry, trigonometry, slide rule, analytic geometry, applied calculus and advanced topics	10	13.5
Science for the technician--covering applied physics, or chemistry, mechanics, thermodynamics, metallurgy, etc.	10	13.5
Technical specialty courses basic to the student's major--elementary and advanced; theory and practice	30	41.0
Supporting technical courses--graphics, engineering laboratory, technical writing	6	8.0
General education courses--English, humanities, social studies, etc.	18	24.0
TOTAL	74	100.0

Content distribution for programs at the highly skilled or industrial level might approximate the following:

Table 4-2

Suggested Course and Semester Credit Hour Requirements for Community College Curriculums for Highly Skilled (Industrial) Technicians

Divisions of the Curriculum and Suggested Courses	Semester Credit Hour Requirements (One credit for one lecture hour or for three lab hours)	
	Credit Hours	% of Total
Mathematics--a one-year technical math course covering advanced arithmetic, algebra, geometry, trigonometry, and slide rule	6	8
Applied science--technical physics or technical chemistry	8	11
Technical specialty courses basic to the student's major--some theory, but emphasis on practice	36	49
Supporting technical courses--drafting, general shop, etc.	9	12
General education courses--English, humanities, social studies	15	20
TOTAL	74	100

Content distributions similar to the patterns shown above can easily be deduced for curriculums in the business and service occupations fields. Different selections of supporting courses would be made, of course, and more emphasis might be given to courses in social studies, economics, and the humanities, with correspondingly less emphasis on science and mathematics.

Necessity for Several "Levels" of Courses. The community college offers educational opportunity to students with a wide range of academic abilities -- all the way from 85 I. Q. up to a genius level. By and large the students who are enrolled in occupational education programs are not outstanding in terms of their purely academic achievements and abilities, though they may be extremely talented along other lines. With such a range of academic abilities it becomes necessary to provide several levels of courses in the academic fields. "Transfer" (college-parallel) courses in English, mathematics, science, the social sciences, and the humanities must obviously be the equivalent in content and rigor of their counterparts on university campuses. But occupational students should ordinarily not be put in these courses. It is just as untenable to require occupationally oriented students to take these rigorous academic courses on the ground that everybody needs some exposure to the "common learnings" as it would be to require the social science major, for example, to take several highly specialized courses in sheet metal, welding, and electronics on the ground that, as a future economist, he must have some knowledge about industrial processes.

Post-high school study of the common learnings by all students in a community college is strongly recommended, but both the level and the content of these courses for most employment-bound students should be different from that of the courses required of university-bound students.

A comprehensive community college may find it necessary, for example, to offer three levels of English, three levels or sequences of mathematics, and two levels or sequences of courses in the social studies.

"Transfer" courses carry both associate degree and baccalaureate degree credit. Most of the general education and supporting technical courses for occupational students carry associate degree credit but not baccalaureate degree credit (at least not at the universities and more prestigious 4-year colleges). It may be advisable to provide certain "repair" courses in English grammar, reading improvement, and mathematics drill, for which no associate degree credit will be given. Some community colleges find a need for such courses, usually at about 10th grade level, for students with poor records from high school.

Distinction between quality and level

Level is not synonymous with *quality*. A rigorous, transfer course can be of poor quality if it is poorly organized and poorly taught. A much less demanding (in terms of theoretical content) course in auto mechanics can be of high quality if it is well taught. *Level* has to do with academic rigor and with theoretical and esoteric content. *Quality* has to do with the extent to which a course or curriculums in community colleges may range across the entire spectrum of *levels*, but (ideally) they will all be of high quality.

Some selected curriculums for associate degree occupational educational programs -- guidelines for planning

There follows a number of curriculum patterns for consideration as planning progresses. Some are at the semi-professional or technician level, some at the skilled-trade level. Brief course descriptions for the general education courses and the supporting technical courses are included in Appendix II on Core Curriculum Suggestions. It is emphasized that there is nothing sacred or magic about these suggested curriculums or courses. Their inclusion here does not make them mandatory. They are included as suggestions for consideration or as guidelines to current practice. Local exigencies and "on the spot" planning may dictate departures from them.

AN ELECTRONICS TECHNOLOGY CURRICULUM
(Semiprofessional Level--Public Junior College)
(Associate Degree Program)

Freshman Year

Courses	Units	Hrs. Per Wk. Each Semester Lecture	Lab	Total
English A-B	3 - 3	3		3
Technical Physics A-B	4 - 4	3	3	6
Technical Mathematics A-B	3 - 3	3		3
Introduction to Graphics A-B	1 - 1		2	2
Engineering Laboratory A-B	3 - 3	1	6	7
Electronics A-B	5 - 5	3	6	9
TOTALS	19 -19	13	17	30

Sophomore Year

(Three Options Available)

Example 1: Communications Electronics Option

Semester I

Courses	Units	Hours Per Week Lecture	Lab	Total
American History	3	3		3
Speech (or other elective)	3	3		3
Technical Mathematics C	3	3		3
Circuit Design and Analysis	5	3	6	9
Transmitters and Receivers	5	3	6	9
TOTALS	19	15	12	27

Semester II

Courses	Units	Hours Per Week Lecture	Lab	Total
Economics	3	3		3
Psychology (or other elective)	3	3		3
UHF and Microwave	5	3	6	9
Transistor Theory and Circuitry	2	1	3	4
Television Circuits	5	3	6	9
TOTALS	18	13	15	28

GENERAL BUSINESS MANAGEMENT

(Semiprofessional Level--Private Junior College)
(Associate Degree Program)

Freshman Year (Quarter System)

Courses	Semester Credit Hrs.
First Term	
Principles of Accounting I	2
Business Organization and Management I	2
Mathematics I	2½
English A	2
Orientation	1
Second Term	
Principles of Accounting II	2
Business Organization and Management II	2
Mathematics II	2½
English Composition	2
General Psychology	2
Third Term	
Principles of Accounting III	2
Effective Speaking	2
Law of Contracts	2
Business Correspondence	2
Physical Science Survey	2½
TOTAL	30½

Sophomore Year

Courses	Semester Credit Hrs.
First Term	
Principles of Marketing	3
Principles of Economics	2½
Law of Partnership and Corporation	2
Report Writing	2
Second Term	
Sales Fundamentals	3
American Government	2½
Law of Negotiable Instruments	2
Economic Problems	2½
Third Term	
Advertising Principles	3
Finance	3
Bases of American Culture	2½
Principles of Credits and Collections	2
TOTAL	30

Total semester credit hours for the two-year curriculum 60½

LEGAL SECRETARY

(Semiprofessional Level--Public Junior College)
(Associate Degree Program)

Freshman Year

Courses	Credit Hours Semester I	Credit Hours Semester II
English A-B	3	3
History	3	
Economics		3
Approved Typing	3	3
Stenography A-B	4	4
Introduction to Business	3	
Modeling & Fashions		2
Business Mathematics A-B	2	2
TOTALS	18	17

Sophomore Year

Courses	Credit Hours Semester I	Credit Hours Semester II
Secretarial English	3	
Stenography C-D	3	3
Accounting A-B	3	3
Typing - If Needed	3	
Office Practice A-B	3	3
Machine Calculation		3
Legal Terminology		3
Business Law A-B	3	3
TOTALS	18	18

Total credit hours for two-year curriculum 71

BUSINESS DATA PROCESSING

(Semiprofessional Level--Public Junior College)
(Associate Degree Program)

Freshman Year

Courses	Credit Hours Semester I	Credit Hours Semester II
English A-B	3	3
Accounting A-B	4	4
Bus. Organization & Management	3	
Psychology		3
Technical Mathematics A-B	3	3
Intro. to Business Data Processing		5
Machine Calculation	3	
Elective	2	
TOTALS	18	18

Sophomore Year

Courses	Credit Hours Semester I	Credit Hours Semester II
American History	3	
Economics		3
Accounting C-D	3	3
Business Statistics	4	
Intro. to Electronic Computers	3	3
Technical Mathematics D	3	
Elective	2	
Programming Business Data		5
Field Project		3
TOTALS	18	17

Total credit hours for two-year curriculum 71

AN AUTOMOTIVE TECHNOLOGY CURRICULUM

(Highly Skilled Technician Level--Public Junior College)
(Associate Degree Program)

Freshman Year

Semester I

Courses	Credit Hours
English A	3
Physics A	4
Mathematics A	3
Graphics I	2
Automotive Technology I (Engines)	5
TOTAL	17

Semester II

Courses	Credit Hours
English B	3
Physics B	4
Mathematics B	3
Graphics II	2
Automotive Technology II (Electricity)	3
Automotive Technology III (Carburetion)	3
TOTAL	18

Sophomore Year

Semester I

Courses	Credit Hours
History	3
Machine Tools	3
Hydraulics	3
Automotive Technology IV (Ignition)	2
Automotive Technology V (Transmissions)	4
Report Writing	2
TOTAL	17

Semester II

Courses	Credit Hours
Economics	3
Human Relations	2
Industrial Materials	3
Automotive Technology VI (Test Lab)	3
Automotive Technology VII (Chassis)	2
Automotive Drafting	2
Elective	3
TOTAL	18

Total semester credit hours for the two-year curriculum 70

WELDING

Provides a combined training in Welding and Machine Shop with emphasis on Welding. Students entering without previous shop work must take Metal 51 during the First Semester of attendance.

First Year	Units	
English 51A-51B	3 -	3
Social Science 53A-53B	3 -	3
Mathematics 54	3	
Welding 53A-53B	5 -	5
Metal 51	3	
Machine Shop 53A		3
Orientation 1	1	
Electives		3
TOTALS	18	17

Second Year	Units	
Psychology 51		3
Welding 65A-65B	5 -	5
Machine Shop 54A-54B	4 -	4
Applied Science	3 -	3
Industrial Drawing 30A	3	
Electives		3
Speech 51	3	
TOTALS	18	18

2

Core Curriculums. Each division or department should study the feasibility of programming freshman students in a "core curriculum" scheme. Scheduling is simplified, class size is maintained at economically feasible levels, proliferation of courses is discouraged, and assurance can be given employers that every graduate has a solid base in general education and supporting technical work as well as in the manipulative phases of his specialization. One example only is given in the Appendix. It is for industrial and engineering-technical education, but the same scheme (substituting different specialized and supporting courses) can be used as a guide as each department or division plans a suitable core for its freshman students.

Transfer Curriculums Versus Occupational Curriculums. Students do not sort themselves neatly into "transfer" and "terminal" categories as they enroll in community colleges -- nor indeed, should they do so. One of the best features of the open door community college is that it offers the "second chance," the late decision opportunity, and the climate in which to "find one's self" as a student.

Many "would-be" transfer students eventually find their way (with counselor help) into occupational curriculums, and graduate with the associate degree and enter employment. Some "occupational" students discover a heretofore unrealized scholarship capability and move into the "transfer" stream to an eventual baccalaureate degree. Some students fail in one or the other (sometimes both) program and drop out without finishing either. Nationwide, in the typical medium-to-large community college (of 2,000 students or more) nearly two-thirds of the entering freshmen express a preference for the transfer program. Many of these can be counseled into an occupational program either before registering or after one semester in the academic program. Attrition (from all causes, and across the board in all curriculums) during and at the end of the freshman year typically runs 40% for community colleges. This seems high, but it is actually the same figure as that for all colleges on a national basis.

Guidance is the key to the proper distribution of students in curriculums where they can best succeed. Flexibility should be maintained so a student can shift from one program to another with as little loss in credit hours as possible. And, in status conscious communities it is highly important that the college president and his faculty constantly emphasize, by action as well as words, the importance of the occupational education program and the successes of its graduates. Otherwise, up to three-fourths of entering students will (supported in many cases by their parents) insist on the college parallel program, with disastrous results -- attrition rates of 75% being not at all uncommon.

Proper testing, counseling, and guidance can prevent this debacle and that is why guidance is so essential in the community college. The next chapter will present some guidelines for these areas.

Chapter V

RECRUITMENT, SELECTION, GUIDANCE, AND RETENTION OF STUDENTS -- PLACEMENT OF GRADUATES

It is recommended that Hawaii's community colleges be "open door" institutions, accepting all high school graduates and, in the case of adults (18 years and over), non-high school graduates who can profit from the instruction offered.

The fact that the college door is open does not mean, however, that all doors to the several programs offered are open. Realistic admissions policies to the several curriculums, based on the known academic and skill demands of the courses involved, should be maintained. Consequently, several levels of programs and courses must be available to students.

Some Rough Classifications. High school grades and standardized test scores are by no means infallible in predicting student success. Many college students were under-achievers in high school, and some were over-achievers. However, some very rough guidelines for selection will be presented herewith, which can be modified by experience as time goes by.[1]

1. Occupational Education Programs
    - a. Semi-professional and technical level programs -- associate degree. Students should have been in the upper half of their high school graduating class and should have scores on SCAT or SAT tests which place them at or above the 40th percentile on the national norms for college freshmen. There is a great variation in the demands of semi-professional curriculums, of course. Electronics technology demands considerable ability in mathematics and science, while the secretarial curriculum would require extremely high verbal skills.
    - b. Programs for the highly skilled trades and skilled services jobs -- associate degree. Students should have high school records placing them above the 25th percentile of their graduating class, and SCAT or SAT test scores above the 10th percentile on national norms for college freshmen. In addition some reasonable indication of mechanical aptitude and manipulative skill should be evident.

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[1] For greater detail see Harris, Norman C., Technical Education in the Junior College/New Programs for New Jobs, American Association of Junior Colleges, Washington, D. C., 1964, p. 83-86.

c. Programs at the semi-skilled and service level -- usually leading to a certificate rather than to the associate degree. Any high school graduate may be admitted plus adults for whom test scores indicate a 10th grade equivalency. Interest and motivation are factors of perhaps greater importance than scholastic ability for students in these programs.

2. College-Parallel Programs

The student's intended major makes quite a difference here, but community colleges have found from years of experience that success in lower division transfer curriculums (by success is meant the completion of the curriculum with a G.P.A. of 2.5 or better on a 4.0 scale) is usually characteristic of those students in the upper third of their high school graduating class, or of students whose SCAT or SAT scores place them above the 50th percentile on national college freshmen norms. (A total CEEB-SAT score of 900 or above [preferably 1000 or above] is the usual attribute of those students who succeed in college-parallel work.)

Some students whose aptitudes and achievement records are below these standards may succeed in community colleges by virtue of unusual application, or by taking a reduced study load for a longer time than the usual two academic years. Furthermore, the community college may (and should) provide "repair" courses to enable such marginal students to remove deficiencies which plagued them in high school.

Since predicting student success is such an uncertain business, the recommendation is that counselors allow students to try the curriculum of their choice if there is some reasonable indication of success. If all evidence at hand indicates probable failure, however, the counselor has no choice but to deny entrance to the curriculum and/or course under consideration. No worthwhile purpose is served for either the student or the college,in allowing students to enroll for courses where failure is almost certain. A variety of "repair" (non-credit) courses should be offered by the college for the purpose of bringing poorly-prepared students up to a level of performance where they might succeed in one of the regular curriculums. If the student fails even these "repair" courses, he would then have to choose between the alternatives of entering a program of studies with less demanding academic requirements, or dropping out of college entirely.

In summary, it is recommended that Hawaii's community colleges accept all high school graduates and adults (over 18), but that reasonably strict (and frequently directive) procedures be used to distribute students among curriculums and courses. If a poorly prepared student is not willing to enroll in or is not capable of succeeding in "repair" courses, he certainly should not be enrolled in "regular" associate degree courses.

Guidance Services.[1] Guidance includes testing (much of which might well be done during the summer prior to registration), advising on careers and educational goals, helping students prepare their class schedules, assisting students in adjusting to college, making referrals for personal and emotional problems, and periodically evaluating the student's progress. These periodic evaluations occasionally result in a necessity to change career and educational goals, and the counselor must skillfully walk the thin line between permissiveness and direction in these instances. Non-directive techniques are to be encouraged up to a point; but the really professional counselor realizes when that point has been reached -- when it is necessary for him to exercise some direction in bringing the student to decide on a new objective in life and on a different curriculum or program. In colleges with effective guidance programs perhaps two-thirds of "would-be" transfer students (those who elect the college parallel program and do not succeed) are eventually guided into curriculums in some occupational field where purely academic scholarship is not the primary requirement. In contrast, colleges with poorly staffed or non-existent guidance programs find that most of the "would-be" transfers merely drop out of college when the first (unsatisfactory) grade reports come in. This wholesale drop-out is a personal tragedy to the students concerned, and a real loss to society in terms of future middle-level manpower needs.

The following recommendations are made for the guidance programs of Hawaii's community colleges:[2]

1. Establish a recognized guidance program in each institution, headed by a person with professional training in testing, guidance, and counseling. (This need not be a full-time position in small colleges.)

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[1] See McDaniel, J. W., Essential Student Personnel Practices for Junior Colleges, American Association of Junior Colleges, Washington, D. C., 1962; and Harris, Norman C., op. cit., p. 81-91.

[2] See Johnson, B. Lamar, Starting A Community College, American Association of Junior Colleges, Washington, D. C., 1964, p. 23-33.

2. Provide counselors at the rate of one full time equivalent counselor for every 300 students in the college. This would, on the average, enable each student to have about three hours of counselor time per academic year.
3. In addition, provide for student advisement by selected faculty members whose background of experience in a particular vocational field can bring real meaning to discussions of careers and educational and training requirements.
4. Provide for a complete testing program, the tests to be administered to the students several weeks before registration (or even during the spring of their final high school year) in order that the results will be available for student-counselor discussions during the registration period.
5. Provide a one-hour per week, one-credit orientation course, required of all freshman during their first semester. Group guidance can thus supplement the individual student-counselor sessions.

Placement Services.[1] Although the services offered by state employment offices should certainly be used to the extent that they are suited to the needs of community college students and graduates, the college should maintain its own placement office, staffed by a competent director. In small colleges the position need not be full time, but the office should be "manned" throughout the working day so that ready communication with potential employers is assured. Instructors and coordinators in the various occupational fields will also assist in placement, but the overall effort should be identified as the responsibility of one person and it should be centralized in one office.

Recently, there have been suggestions put forward in some quarters that all placement activities be turned over to federal and state employment agencies. Some local offices of these agencies have expressed a desire to open an office on the college campus and take care of all the college placement. It is strongly recommended that this not be done, for several reasons. A few are listed:

1. Colleges educate and train persons for a relatively few highly specialized occupational areas, in response to local, regional, and national needs. Wide-awake college staff members should know more about job openings in these fields (through advisory committee contacts, etc.) than the local employment office does.

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[1] See Mohs, Milton C., Service Through Placement in the Junior College, American Association of Junior Colleges, Washington, D. C., 1962. Also, Harris, op. cit., p. 89-91.

2. Direct contacts (without intermediaries) should be maintained with employers, so that "feed-back" for curriculum development can take place.
3. Without arguing its validity, the fact remains that state and federal employment offices are regarded by many potential employers as unemployment offices. As long as they retain this image it is a distinct disservice to community college graduates to turn them over to these offices for placement.

Granted that placement services for the rank and file of American workers are needed, and that by and large state and federal offices are doing an effective job in placing persons who are "out of work" for one reason or another, these offices are not the primary channel through which community college educated and trained persons should be placed. The college placement office is.

The college placement office will be called upon to serve a student both for "casual" placement (i. e., part-time jobs which may or may not be related to the student's major field of study) and for "career" placement (placement in a full time job for which he has prepared himself by completing an occupational curriculum at the college).

Both of these functions are legitimate activities of the placement office, but the latter is, by far, the more important of the two, and it should receive the major effort of placement officials. The success of, and indeed the actual justification for, community college occupational education depends on placing graduates in jobs for which they have been educated and trained.

Chapter VI

ADMINISTRATION AND STAFFING OF THE OCCUPATIONAL EDUCATION PROGRAM

A community college is only as good as its president and its faculty. No amount of money, no amount of planning, and no amount of supervision and control from above will make a good college out of one where the campus leadership is weak and the faculty mediocre.

The first and most important step then, in planning a community college, is to employ the best man available as its chief administrator. He, in turn, will recommend the employment of able, effective, professional persons as his administrative assistants and his teaching faculty.

One essential criterion in choosing a president for a comprehensive community college is that he must subscribe unreservedly to the philosophy of "open door" opportunity for all high school graduates of the area. In his mind there must be no "second class" students. Students may have differing abilities, different career and educational goals, differing approaches to the problems of school and of life, but the president must support the position that all are worthy of the college's best efforts to educate and train them. Further, he must not only give lip service to this concept, he must literally exude it in his daily actions, identifying himself personally with the occupational education activities of his college, as well as with the college-parallel programs.[1] One very able president of a mainland community college, whose original subject discipline through the Master's Degree was English, has identified himself with the occupational education program of his college by developing the general education English course for occupational students and teaching one section of it himself.

At the dean (or secondary) level of administration it is highly important also to provide able and inspiring leadership. One administrative structure which allows for equal emphasis on both occupational and college-parallel education is to have two deans -- one for all the occupational education programs and another for the college parallel program. Figure 6-1 illustrates this kind of administrative structure.

An even better arrangement, in the opinion of the writer, is to provide a dean of applied arts and sciences who will give leadership to all programs which have occupational preparation as their purpose, whether these are certificate, associate-degree, or baccalaureate-degree oriented; and a dean of liberal arts and sciences to give leadership to all programs and courses whose purpose is non-occupational. This scheme, although admittedly somewhat more difficult to administer, avoids the schism between terminal and transfer programs. Neither the student body nor the faculty is divided into two camps. Everybody is concerned with the total job of education and training and a truly comprehensive community college can result. Figure 6-2 illustrates this kind of administrative pattern.

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[1] See "Administrative Leadership in Vocational-Technical Education", by Norman C. Harris, in Junior College Journal, March, 1962.

Figure 6-1:

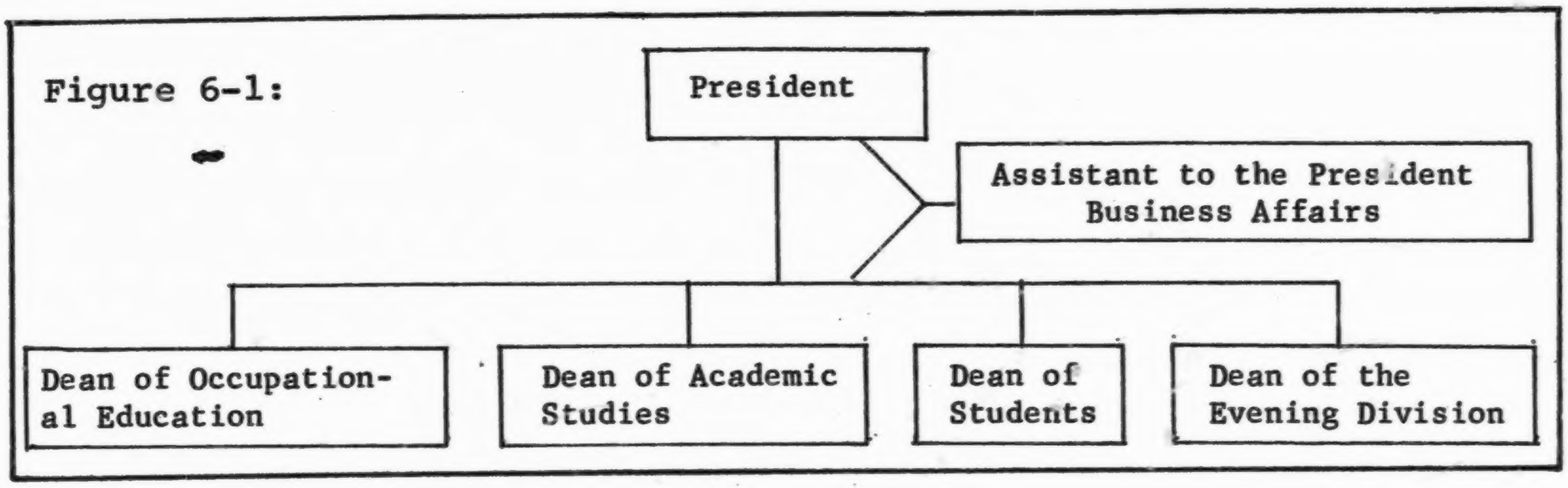
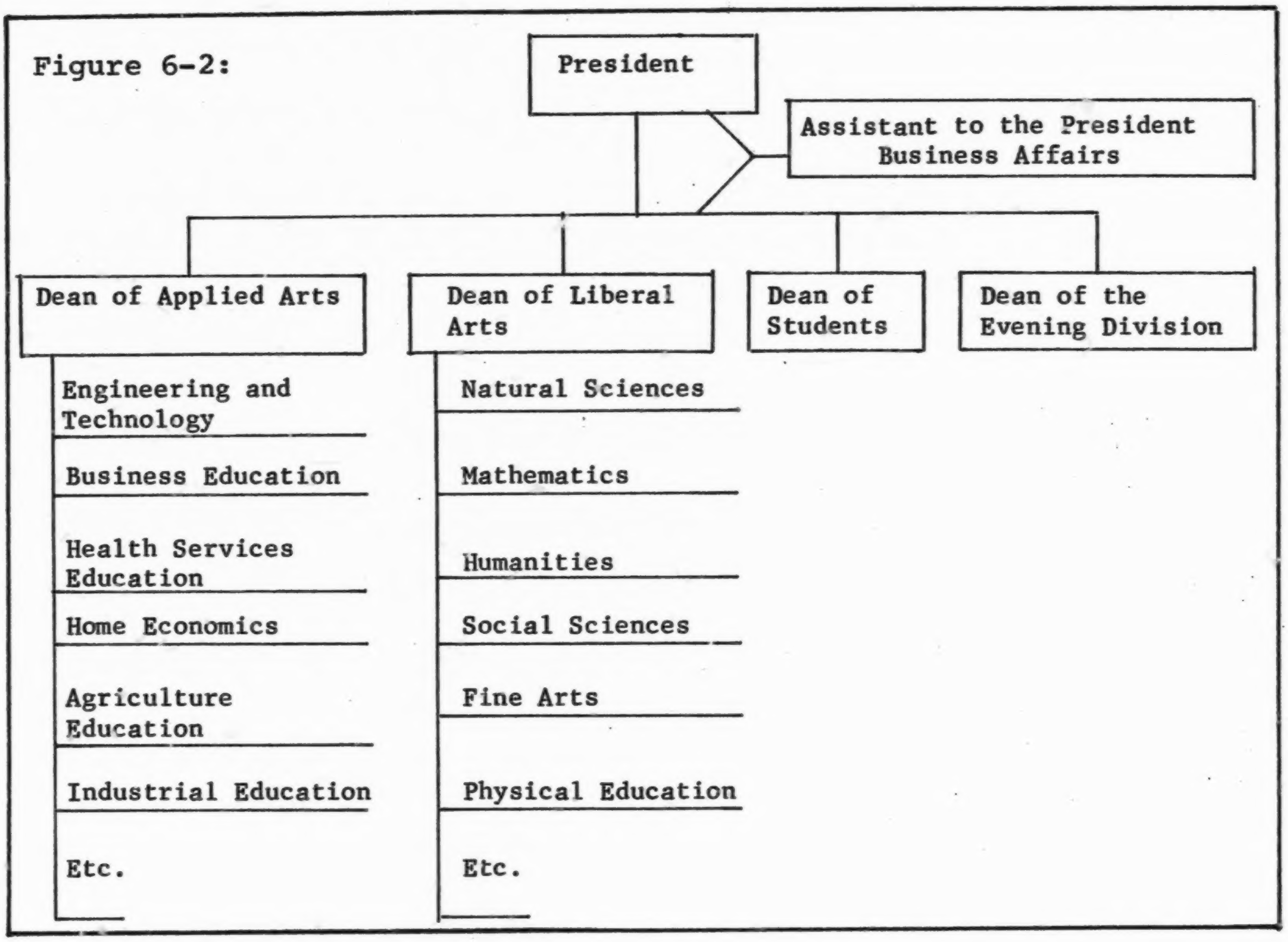

President
Assistant to the President Business Affairs
Dean of Occupational Education
Dean of Academic Studies
Dean of Students
Dean of the Evening Division

Figure 6-2:


President
Assistant to the President Business Affairs
Dean of Applied Arts
Dean of Liberal Arts
Dean of Students
Dean of the Evening Division
Engineering and Technology
Business Education
Health Services Education
Home Economics
Agriculture Education
Industrial Education
Etc.
Natural Sciences
Mathematics
Humanities
Social Sciences
Fine Arts
Physical Education
Etc.

Faculty Participation. The wise and capable administrator will provide for a maximum amount of faculty participation in planning. Committees will be actively studying curriculum, course content, community needs, student characteristics, faculty salaries and welfare, placement of graduates in jobs, success (or lack of it) of transfers to four-year colleges, and the effectiveness of various approaches to teaching and learning. Committees will make reports, and these reports will be acted upon. Obviously not all faculty recommendations will be approved, but they will be acted upon, not shelved! The professional administrator provides the climate in which his faculty will become professional teachers. Suspicion of administrative practices is thus minimized; carping is less evident; "end-runs" outside established channels are avoided; and the "we-they complex" can be minimized -- perhaps even eliminated.

Furthermore, and most important, through faculty participation in planning, future administrative leaders discover themselves and are discovered, thus assuring a flow of emerging talent so vital to the rapidly growing community college movement.

Faculty Policy. The "good" community college instructor is hard to define. Certainly, however, the following characteristics would be possessed by most good teachers:

1. Depth of knowledge in the subject matter to be taught, as evidenced by:
   a. For teachers of occupational subjects:
      Journeyman or master mechanic status in a trade or five years of successful experience in a professional, semi-professional, or technical occupation.
   b. For teachers of academic, supporting technical and general education subjects:
      A master's degree in the subject field.
2. An understanding and full acceptance of the community college philosophy -- that comprehensiveness is to be desired, not deplored -- that educational opportunity should be expanded, not restricted -- and that quality within diversity is not only possible, but desirable.
3. A sincere interest in classroom teaching as a career rather than a consuming desire to do research. Research and writing should not be frowned upon -- far from it -- but the emphasis should be on teaching.

4. A sincere interest in young people, but an approach which treats them as young adults, and demands their best effort -- both in the classroom and on outside study assignments.
5. A knowledge of the psychology of learning and of ways to motivate students with differing abilities and interests.
6. A first-hand knowledge of the world of work as it relates to the teacher's subject matter field (teachers of occupational subjects and supporting technical subjects).

Finding such persons in sufficient numbers to staff Hawaii's developing system of community colleges will not be easy. It would be well if each faculty could be a blend of mature, experienced teachers and young, well-prepared beginning teachers. In order to recruit, employ, and hold the kind of teachers here described, a very attractive salary schedule will have to be adopted and serious consideration should be given to providing a reasonable moving allowance for teachers employed from the mainland.

Faculty promotion and merit pay policies should compare favorably with those of mainland community colleges. No suggestions in dollar amounts on these matters will be given here, except to point out the absolute necessity of a pay and promotion plan which will equate industrial and business experience (occupational education teachers) to degrees and credits earned (teachers of academic subjects) _at least through the Master's Degree level_. A suggested equation is: seven years of bona-fide, highly successful experience (success evidenced by promotion, etc.) equals the Master's Degree.

Faculty Load. Membership on a college faculty involves a great deal more than "meeting classes." For every hour of _lecture class_ assignment an hour of preparation and paper grading is a normal expectation. For every three-hour lab (shop) assignment an hour of preparation and two hours of maintenance, paper-grading, inventorying, and "shop housekeeping" would be expected. Committee work is expected of all teachers, and at least five hours should be set aside by each faculty member for student consultation each week. These "office hours" should be posted and religiously kept, and students encouraged to avail themselves of this opportunity for personal consultation, help with tough assignments, or advice on career decisions. Many teachers will also work with student clubs and organizations.

Consequently, the _teaching_ load in community colleges usually approximates the following:

1. For teachers whose entire load is "lecture" classes -- 15 hours/week
2. For teachers (if any) whose entire load is lab (shop) classes -- 25 hours/week
3. For teachers whose load is part lecture - part lab -- an assignment between these extremes

Class size, as well as teaching hours, affects load, and a normal expectation is that a teacher would accumulate 450 student contact hours per week. (Five 3-hour classes times 30 students per class equals 450 student contact hours, abbreviated SCH.) If a teacher's SCH is high, his clock hours might be reduced somewhat, and if the SCH is low the clock hours might be increased.

The rationale is that a teacher will spend 30 hours per week in activities directly related to teaching, 5 hours per week in "office hours" for student consultations, and 5 or more hours per week in committee work, budget preparation, report writing, community and parent contacts, and work with student activities.

Most good teachers, if they actually keep track of all the time spent on activities directly or indirectly related to their job as a college faculty member, find that some 50-55 hours per week is the usual average.

Summary

A trite but true slogan of the market place is, "you get about what you pay for", and certainly it also applies to professional services. The surest way to accumulate a mediocre faculty is to pay mediocre salaries. The only way to acquire and retain a high quality professional faculty is to pay professional salaries, and then provide an opportunity for and demand professional performance.

Chapter VII

FACILITIES AND FINANCE

Although community colleges, in general, show lower unit costs than universities, higher education of any kind costs money. And an expansion of higher education in a state will necessitate increased appropriations from the legislature. To the greatest extent possible the cost should be borne by the state, since it is society as a whole which benefits from a rising level of education and training. Thousands of Hawaii youth who will need post-high school education and training in the decades ahead will have their chance only if decisions are made now to provide it. Lead time for community college development is from three to five years (i.e., elapsed time between a legislative decision to provide a college and the actual operation of the college with a broad offering of one- and two-year programs).

An earlier section of this report presented evidence on the economic impact of higher education, and revealed that, as of 1960, Hawaii was not in a very enviable position with respect to the educational attainment of its 18 to 24 year old citizens. In the context of Dr. Lee Martin's remarks, quoted earlier,[1] the approach to financing Hawaii's community colleges should be not, "How much can we afford?"; but "How much shall we invest in Hawaii's future?" In this connection it is instructive to note that although the cost for a year of community college education averages about $600 per student for many states, these same states find that it costs $1,800 to keep a juvenile delinquent in a detention home and $4,000 to keep a criminal in the state prison.

FORECAST OF FACILITIES

Overall planning for campus development and capital outlay expenditure is being conducted by others on the Community College System staff. Consequently this subject will be dealt with rather superficially here.

Leeward Oahu. A site of some 50 or more acres will be needed with construction of a complete campus involving classrooms, laboratories, shops, library, administration and student services facilities; and theater, drama, and music facilities. Based on a projected enrollment of 2,500 students by 1971 the capital outlay for this campus might reach $5,700,000 by that year. (Averaged from more than a score of new campuses constructed from Massachusetts to California in recent years, community college campuses are costing from $2,000 to $4,000 per student enrolled.)

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[1] See page 10.

Honolulu (Kapiolani and Honolulu Technical Schools). If these institutions can be combined, as suggested in an earlier chapter, the total enrollment may reach 6,000 by 1975. If a totally new campus is built a capital investment of some $15,000,000 (less amounts deductible for state-owned assets at the two present sites) could be envisioned.

If Honolulu Tech develops into a community college on its present location, and Kapiolani develops by itself on a new site, the capital investment required might be somewhat less, depending on amounts realized from the "sale" of the Kapiolani site. To offset this probable reduction of capital investment however would be the matter of duplication of facilities (science labs, libraries, administration and student services buildings, etc.) on both campuses, and also the matter of the continuing duplication of administrative and maintenance costs for two campuses.

Maui. Purchase of additional land and expansion of the present technical school campus is a good possibility. New facilities to be added should include a library, a classroom building, science laboratories, a little theater (drama, art, and music building) and an administration-student services building (or wing). Total cost of this development, distributed over a four-year period, may approximate $2,700,000.

Kauai. It is probable that Kauai will be operated as a technical school for several years with only modest capital outlay for equipment modernization in the meantime. When the time comes to convert to community college status a new site will be required and a complete new campus, master-planned for 400 to 500 students, will be required. At this time a capital investment of around $2,000,000 is to be expected.

Typical Costs of Certain Facilities. Based on mainland community college construction and equipment costs, some guidelines are given here for estimating purposes.

Classroom buildings -- per square foot	$16 to $20
Laboratories, including furniture, per square foot	$20 to $24
Auditorium-theater, including stage and all equipment -- per square foot	$20 to $25
Library, including stacks, and built-in cases -- per square foot	$20 to $24
Shops (not including equipment) per square foot	$12 to $15

Complete equipment for a physics laboratory with 20 student stations (engineering physics and technical physics equipment)	$ 40,000
Complete equipment for an electrical technology laboratory -- electronics technology laboratory (20 student stations)	$100,000
Complete equipment for a data processing laboratory (if purchased)	$ 80,000
Complete equipment for a manufacturing processes lab/shop (if all new)	$100,000
Complete equipment for a dental office assisting program (20 students)	$ 25,000
Complete equipment for civil technology program (20 students)	$ 11,000
Furniture and equipment for a drafting and design laboratory (30 students)	$ 20,000
Furniture and equipment for an office machines laboratory (20 students)	$ 18,000

The above estimates are for new equipment. Much of the equipment now in the technical schools is in good condition and fairly modern. Some of it is obsolete, however, and should be replaced. Certain machine-type equipment and a limited amount of electronics equipment can be obtained through state and military surplus property channels.

Mention should be made of significant sums of money which will be available to Hawaii for community college purposes under recently enacted Federal laws (P. L. 88-204, the Higher Education Facilities Act, and P. L. 88-210, the Vocational Education Act). Combining the amounts which might be available to Hawaii's community colleges from both of these education acts results in a possible sum of from $400,000 to perhaps $550,000 annually over the next several years. These funds will be available for specific projects and must be matched with state funds.

It should also be pointed out that, in many states, local industry, private philanthropy, and educational foundations have contributed significantly to the building and equipping of public community college facilities. Three of Michigan's community colleges have engineering-technology buildings (each costing over $1,000,000) which were almost totally financed by private gifts. Several other mid-western colleges have received bequests totalling over $1,000,000, some for libraries, some for theater-drama-art centers, and some for residence halls. The possibilities of such philanthropic giving should be aggressively explored in Hawaii.

Summary

Quality education costs a great deal of money. And occupational education programs and facilities and equipment are more costly, generally speaking, than are college-parallel (especially liberal arts) programs.

Education needs financial support at all levels. One of the most neglected areas in the past and a critical area at present is that of occupational education at the post-high school level. This seems especially true of Hawaii.

It should also be remembered that monies invested in occupational education programs are, for the most part, used in educating and training youth who are more likely to remain in and contribute to the life and economy of their local communities and the State of Hawaii. While public funds must continue to be expended for academic and liberal arts programs (let it be clearly understood that the writer is strongly in favor of these programs also), the occupational education programs must be given equal attention. The State of Hawaii can achieve its coveted potential as a scientific and cultural hub of the Pacific only if it has a large base of highly trained and educated manpower which can support its scientists and appreciate its artists.

Chapter VIII

SUMMARY OF RECOMMENDATIONS

A. Initiation of a community college system

1. Plan, establish, and operate a system of "open-door" comprehensive community colleges whose purpose will be to expand educational opportunity for youth and adults throughout the state. Both occupational education and college-parallel education programs should be offered.
2. Set policy at the regent and central administration level, but allow considerable local autonomy within the policy framework among the colleges. Allow community college administrators and faculty the creativity and freedom of action which are their professional privilege and indeed their professional obligation.
3. Select and appoint a high-level community college advisory committee to operate at the state-wide level. Persons at the presidential, managerial, or command level from business, industry, shipping, the military, hotel and tourism, government, labor, and landholding interests should be included.
4. Set up a Community College - University of Hawaii Liaison Committee to study over-all problems. Sub-committees can study specific problems in subject matter areas.
5. Take over the technical schools, as authorized by law, on July 1, 1965.
6. Adopt an over-all planning scheme on a "systems analysis" approach with all of the following involved:
    a. feasibility studies
    b. alternative and optional plans
    c. lead times for every phase of development
    d. contingency plans for unforeseen events
    e. capital improvement plans
    f. annual operating budgets
    g. long-term curriculum development plans, with proposed budgets

   This might be worked out on a master wall chart with overlays of clear plastic showing the "input" for given phases and specified years.
7. Provide for close and continuing cooperation and liaison with the high schools (both public and private) of the state.

8. As soon as regent and legislative approvals are official, begin an active public information campaign. Prepare attractive leaflets, brochures, prospecti, etc., and disseminate this literature widely.
9. Plan attractive, functional campuses for all locations -- campuses with a college atmosphere and with the very best of modern facilities.

B. Programs and curriculum

1. Provide for equal emphasis on occupational education and college-parallel education in both day and evening programs. Make sure each administrator is wholly in accord with this philosophy. Staff each college with a dean for each of these areas.
2. Emphasize a strong program of guidance, counseling, and placement.
3. Provide for general education, up to one-fourth of the total credit hours, in all programs leading to the associate degree.
4. Retain a strong emphasis on the trades and services occupations, but add a number of curriculums at semi-professional, technical and middle management levels.
5. Seek the necessary legislative changes to authorize apprenticeship training by the community colleges. Provide for apprenticeship coordinators and establish close working relationships with organized labor, both for pre-employment programs and for evening related instruction for apprentices.
6. Conduct community surveys in each county before phasing into community college operation, and run "spot" surveys frequently to plan for specific programs.
7. Plan for some differentiation of function among campuses to avoid expensive duplication of facilities.
8. Add new programs only after careful planning. Provide for students from one location to attend another campus rather than starting a new (expensive) program for only a handful of students.

C. Administration and faculty

1. Strive to obtain a reasonable balance between local (i.e., Hawaii) persons and persons from the mainland in the employment of administrators and new faculty.
2. Plan for an administrative and faculty salary schedule which will attract the high quality persons who will be needed if the community college system is to fulfill its purposes.

3. Initiate at the University of Hawaii a special program for the education and training of community college instructors -- for both college-parallel and occupational education fields.

D. Financial and other considerations

1. Keep tuition as low as possible -- at a figure no more than 75% of the University of Hawaii tuition, or no more than one-third of the annual per-student operating costs, whichever is lower.
2. Avoid, if at all possible, line-item budgets.
3. Avoid decisions on educational matters based primarily on "political" considerations.
4. Continue efforts to improve the basic legislation (Act 39); the island of Hawaii should be included in the Community College System.
5. Make sure that community college representation on the State Board of Vocational Education or on the Advisory Council to the State Board is assured. This is a matter of great urgency with respect to federal monies from P. L. 88-210 (Vocational Education Act of 1963).

(Mrs. Jane Nawahi and Miss Gladys Kajiwara prepared the manuscript for printing.)

APPENDIX A

SAMPLE INSTRUMENTS FOR COMMUNITY SURVEYS

1. County Education Survey
2. Business and Industry Survey
3. Information Sheet for High School Seniors

Sample 1 CONFIDENTIAL

_______ COUNTY EDUCATION SURVEY

Industry and Business Questionnaire

Introduction: The purpose of this questionnaire is to gather information and opinions of industrial and business employers which may have implications for post-high school education and training in _____ County. The results will become a part of a county-wide study now being conducted by the _____ County Citizens' Survey Committee studying the establishment of a community college. You can aid in this study by completing the questionnaire as completely as possible. The results will be used for statistical purposes only and your firm will not be identified in any published reports.

SPECIAL NOTES: 1) Except for large firms, the completion of the questionnaire will require only a few minutes. Study the heading of each item carefully. If it is applicable to your firm, please provide the information requested. If not applicable, proceed to the next item.

2) The community college, when established, will offer both college-parallel work and occupational education programs. This questionnaire relates only to the occupational programs.

1. Firm Name ____

2. Address of Firm ____

3. Name of Person Completing Questionnaire ____________________

4. Your Job Title ____

5. Telephone Number and Extension ____________________

6. Information on Current Employment. Please list the number of employees in your firm, according to the following classifications, as of __________ (date). Include yourself and all others involved in management.

Number of Employees	Administrative or Managerial	Profess. and/or Sci./Engr.	Semi-Professional	Highly Skilled Technicians	Secretarial and other Clerical	Sales Personnel	Skilled Trades	Service Personnel	Unskilled Labor
As of (date)									

7. Information on Manpower Needs. Please list the number of job openings your firm will probably have during the current year for persons in the occupational categories listed.

1. Professional and/or Science/Engineering ______
2. Semi-professional ______
3. Highly Skilled technicians ______
4. Secretaries ______
5. Other clerical ______
6. Sales personnel ______
7. Finance, insurance, real estate ______
8. Skilled trades (craftsmen) ______
9. Hotel workers ______
10. Restaurant workers ______
11. Unskilled labor ______

Other (list below)

12. ____________________ ______
13. ____________________ ______

8. What kinds of semi-professional personnel (except technicians) are employed by you? Write "none", if you have no semi-professional employees.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			

9. What kinds of highly skilled technicians are employed by you? Write "none" if you have no technician employees.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			

10. What kinds of secretarial, clerical, and accounting personnel are employed by you? Write "none" if you have no employees in these classifications.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			

11. What kinds of sales personnel are employed by you? Write "none" if you do not employ any sales personnel.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			

12. What kinds of skilled tradesmen (craftsmen, cooks, servicemen) are employed by you? Write "none" if you have no employees in this classification.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

13. What kinds of semi-skilled workers are employed by you? (Examples: production workers, operators, waitresses, custodians, maintenance men, hotel workers, etc.) Write "none" if you have no employees in this classification.

Job Title	Number Currently Employed	Estimated Number in Five Years	Education and Experience Requirements. (Please be quite specific.)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

14. To what extent would you be interested in the availability of qualified graduates from community college occupational programs in semi-professional fields:

TECHNICIANS	(1) Much Interest	(2) Some Interest	(3) Little or No Interest
1. Electronics Technology			
2. Mechanical Technology			
3. Civil Technology			
4. Chemical Technology			
5. Engineering Aide (Surveying)			
6. Drafting			
7. Computer Technology			
8. Instrumentation Technology			
9. Medical Technology			
10. Dental Technology			
11. Other Technologies (name them)			
____________			
____________			
____________			
____________			
12. Semi-professional Occupations other than Technologies (list them)			
____________			
____________			
____________			
____________			

	(1) Much Interest	(2) Some Interest	(3) Little or No Interest
13. Graphic Arts (printing, etc.)			
14. Secretarial (incl. stenography)			
15. Accounting and/or Machine Calculation			
16. Business Data Processing			
17. General Office Skills (typing, filing, etc.)			
18. Sales and/or Advertising			
19. Mechanic and Serviceman Training			
20. The Skilled Trades (pre-apprenticeship)			
21. Cooperative apprenticeship training for persons already employed			
22. Others (please list)			
______________________			
______________________			
______________________			

15. When a community college is established in _______ County, what courses and training programs would be most effective in preparing young people and adults for successful employment with your firm? Note both categories below.

    1. Complete courses of study, or curriculums leading to an associate (two-year) degree. (Examples: technician training, secretarial training, accounting and data processing, nursing, drafting, sales and advertising, hotel and restaurant training, etc.)

       Please list:

       1. ______________________________
       2. ______________________________
       3. ______________________________
       4. ______________________________
       5. ______________________________
       6. ______________________________
       7. ______________________________

    2. Short-term courses for intensive up-grading of persons already employed. (Examples: mathematics, applied science, English, technical writing, accounting, real estate courses, etc.)

       Please list:

       1. ______________________________
       2. ______________________________
       3. ______________________________
       4. ______________________________
       5. ______________________________

16. With respect to the requirements of your firm for entry employment, in what job categories do you employ young persons who have just graduated from high school?

Please put a check mark under the heading which best describes your firm's practice with regard to entry employment for young high school graduates, in the job categories listed.

Entry Job Category	1. Common Practice	2. Infrequent	3. Almost Never
1. Semi-professional Jobs			
2. Technician Jobs			
3. Management Trainee			
4. Secretarial Jobs (requiring stenography)			
5. Receptionist, Clerk Typist			
6. Accounting			
7. Bookkeeping			
8. General Office Jobs			
9. Salesman (outside)			
10. Salesperson (store)			
11. Stockman, Warehouseman			
12. Apprenticeship for the Highly Skilled Trades and Crafts			
13. Semi-Skilled Jobs (assembly line and production workers; machine operators)			
14. Service Jobs (hotel, restaurant, etc.)			
15. Unskilled Labor			

17. Recalling the employing practices of your firm for the past five-year period, which one of the following statements best describes your evaluation of young persons just out of high school who have applied for entry jobs with your organization. (Check one)

_____ 1. Most young people who apply seem reasonably well prepared for entry employment, and we have employed them as often as openings have occurred.

_____ 2. We have employed a number of young applicants, but find that they need a considerable amount of additional education and training before they can perform satisfactorily.

_____ 3. We have found it unprofitable to employ young high school graduates, except for unskilled jobs.

_____ 4. The nature of most of the entry jobs in our firm is such that young high school graduates are virtually unemployable, because of a lack of occupational education and training.

18. (This item is only for those firms who employ semi-professional and technical personnel. Others please write "non-applicable.")

With regard to employees in semi-professional and technical occupations, which of the following statements best describe(s) the situation which has existed in _____ County in recent years? (Check one or more, as applicable.)

_____ 1. There seems to be an adequate supply of well-qualified persons available locally to fill semi-professional and technical job openings.
_____ 2. Persons with good potential are available locally, but they must be given most of the necessary training after employment.
_____ 3. Our firm has found it necessary to "recruit" personnel for semi-professional and technical jobs:

    _____ 1. by hiring them away from other firms.
    _____ 2. from colleges and technical schools in Hawaii, but outside _______ County.
    _____ 3. from colleges and technical institutes outside of Hawaii.

_____ 4. We have not been able to find enough qualified persons for jobs in these categories.

19. Do you have an organized, operating, training department, which conducts formal classroom training for your employees?

_____ 1. Yes _____ 2. No

20. If you checked "yes" for number 19, please answer the following:

1. What kinds of training have you conducted for your employees since 1960? (Examples: executive development, secretarial classes, mathematics-science classes for technicians, trade extension classes for craftsmen, etc.)

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________

2. What kinds of formal training classes do you plan to offer your employees during the next five years?

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________

21. Would your firm be willing to participate(*) in a work experience program (at the community college level) for:

	Yes	No
1. Technicians	___	___
2. Semi-professional Personnel Other Than Technicians	___	___
3. Management Trainees	___	___
4. Secretarial and Clerical Personnel	___	___
5. Mechanics and Repairmen	___	___
6. Apprenticeship for the Skilled Trades and Crafts	___	___
7. The Service Occupations	___	___

(*) Such participation involves the student in part-time work, part-time study. Plans can be arranged for morning study--afternoon work (or vice versa); or study and work on an alternate semester basis. One job can thus be filled the year-around by two students.

22. In addition to all the comments above, list any other ways in which a two-year college could provide you with more adequately trained personnel. (Examples: evening classes, specialized courses, vocational counseling services.)

____

____

____

____

23. General Comments. Here add any comments you (or other officials of your firm) may wish to make about the desirability of a community college for _______ County, and your suggestions as to the kind and level of education and training programs it should provide. Please do not omit this item! Your comments here may be of great value to the Citizens' Committee.

____

____

____

____

Thank you for your interest and cooperation.

_______ COUNTY CITIZENS'
SURVEY COMMITTEE

Sample 2 CONFIDENTIAL

Business and Industry Survey

Introduction: The purpose of this questionnaire is to gather information and opinions from business and industrial employers to use in improving educational programs for employment-bound youth in the ____________________ area. You can help by completing the questionnaire as completely as possible. The results will be used for statistical analysis and your firm will not be identified in any published reports.

Special Note: Except for large firms, the completion of the questionnaire will require only a few minutes. Study the heading of each section. If it is applicable to your firm please check or fill in the information; if not, proceed to the next section.

PART I--General Information

1. Firm name ____

2. Mailing address ____

3. Name of person reporting _________________________________

4. Your job title ____

5. Telephone number _______________________________________

6. Please check the space opposite the description which best identifies the activities of your firm. Check more than one if needed.

_____ 1. Agricultural services
_____ 2. Advertising
_____ 3. Banking and finance
_____ 4. Communications
_____ 5. Construction
_____ 6. Education
_____ 7. Entertainment and recreation
_____ 8. Food, dairy and drink
_____ 9. Government--Federal, State, Local
_____10. Health, hospital, medical, dental
_____11. Hotel and motel
_____12. Industrial or manufacturing
_____13. Insurance
_____14. Marine services
_____15. Printing and publishing
_____16. Professional--other than medical and dental
_____17. Real estate
_____18. Retailing--other than food, dairy and drink
_____19. Service establishment
_____20. Transportation
_____21. Utilities
_____22. Wholesaling
Other: (Write in below)
_____23. ____________________
_____24. ____________________
_____25. ____________________
_____26. ____________________
_____27. ____________________

PART II--Jobs For People With Formal Education Beyond High School, But Less Than 4-Year College Degree

Please supply the information requested, relative to your establishment or firm, for the kinds of jobs listed below for which one or two years of post-high school education and/or training are ordinarily considered desirable or essential. Be sure to consider all the sections--A, B, C, D, E.

Type of job (1)	Average no. on payroll this year (2)	Expected annual rate of employment 1964-70 (check one)			Local supply of qualified employees (check one)		
		Increase (3)	Same (4)	Decrease (5)	Scarce (6)	Adequate (7)	Surplus (8)
A. Industrial jobs							
1. Air cond., refrig., and/or heating technician							
2. Architectural draftsman							
3. Automotive technician							
4. Chemical technician							
5. Civil and highway technician--surveyor							
6. Drafting and design technician							
7. Electrical technician							
8. Electronic technician							
9. Foreman--first-line supervisor							
10. Industrial technician							
11. Instrumentation technician							
12. Mechanical technician							
13. Metallurgical technician							
14. Quality control technician							
Other (write in below)							
15.							
16.							
17.							
18.							
19.							
B. Business jobs							
1. Accountant							
2. Advertising and/or commercial art							
3. Business data processing							
4. Business machine operator							
5. Business management							
6. Merchandising							
7. Outside salesman							

Type of job (1)	Average no. on payroll this year (2)	Expected annual rate of employment 1964-70 (check one)			Local supply of qualified employees (check one)		
		In-crease (3)	Same (4)	De-crease (5)	Scarce (6)	Ade-quate (7)	Sur-plus (8)
B. Business jobs (con't)							
8. Real estate, insurance and/or finance							
9. Retail management and buying							
10. Sales manager							
11. Secretary							
Specialty?							
12. Typist--clerk							
13. Other (write in spaces below)							
14.							
15.							
16.							
17.							
C. Health, Hospital and Medical Jobs							
1. Dental office asst.							
2. Dental hygienist							
3. Medical office asst.							
4. Medical lab technician							
5. Nurse (Practical)							
6. Nurse (Registered)							
7. Psychiatric technician							
8. X-ray technician							
Other (write in below)							
9.							
D. Agriculture jobs (write in below)							
1.							
2.							
3.							
4.							
E. Service jobs							
1. Beauty operator (Cosmetician)							
2. Cafeteria manager							
3. Commercial baker							
4. Cook (chef)							
5. Cook (short order)							
6. Dining room hostess							
7. Hotel front office worker							
8. Hotel room service worker							
9. Waitress							
Other (write in below)							
10.							
11.							
12.							

PART III--Employer Opinion and Practice

A. With respect to the requirements of your firm for entry employment, in what job categories do you employ young persons who have "dropped out" without finishing high school? Please put check marks under the headings which best describe your firm's operating policies. Make entries in this section for high school "dropouts" only.

Entry job category	Frequency of employment		
	Common Practice (1)	Infre-quently (2)	Almost Never (3)
1. Highly-skilled jobs			
2. Business office jobs			
3. Sales jobs			
4. Apprenticeship for the highly-skilled trades and crafts			
5. Semi-skilled jobs (assembly line and production workers;machine operators)			
6. Service jobs			
7. Unskilled labor			

B. With respect to the requirements of your firm for entry employment, in what job categories do you employ young persons who have just graduated from high school? Please put check marks under the headings which best describe your firm's operating policy. Make entries here for new high school graduates only.

Entry job category	Frequency of employment		
	Common Practice (1)	Infre-quently (2)	Almost Never (3)
1. Technician jobs			
2. Highly-skilled jobs			
3. Business office jobs			
4. Sales jobs			
5. Apprenticeship for the highly-skilled trades and crafts			
6. Semi-skilled jobs (assembly line, cannery, and production workers; machine operators)			
7. Service jobs			
8. Unskilled labor			

C. Recalling the employing practices of your firm for the past five-year period, which one of the following statements best describes your evaluation of young persons who have applied for entry jobs with your organization? Please check as many as are applicable.

_____ (1) We have employed a number of young high-school dropouts, and we have found they can perform satisfactorily in the following jobs: (specify)

____

____

_____ (2) We have employed a number of young high-school dropouts, but find they need a considerable amount of additional education and/or training before they can perform satisfactorily.

_____ (3) We have found young high-school dropouts unsatisfactory for the following reasons: ____

____

____

_____ (4) Most young high-school graduates who apply seem reasonably well prepared for entry employment, and we have employed them as openings have occurred.

_____ (5) We have employed a number of young high-school graduates, but find they need a considerable amount of additional education and/or training before they can perform satisfactorily.

_____ (6) We have found it inadvisable to employ young high-school graduates, except for unskilled jobs.

_____ (7) The nature of most of the entry jobs in our firm is such that young high-school graduates are virtually unemployable because of a lack of occupational education and training.

D. To what extent do existing educational facilities in the _______________ area meet the occupational and training needs of your company or firm?

_____ (1) Very well _____ (2) Fairly well _____ (3) Poorly

E. If you think occupational education and training in the area need improvement, which of the following developments would you favor? (You may believe both are important, but please check the one you think most important.)

_____ (1) Substantial expansion of vocational education programs in the existing high schools.

_____ (2) Establishment of a 2-year community college with a strong program of occupational education, and programs for college transfer students as well.

F. Would you and your firm be interested in participating in discussions or further study of plans for improving occupational education and training at high-school and post-high school levels in the _____________area?

_____ (1) Yes _____ (2) No _____ (3) Undecided

G. Is there a formally organized training program in your company or firm?

_____ (1) Yes _____ (3) No

H. If "yes" please check each type of program you now operate on a formal basis:

_____ (1) Apprenticeship
_____ (2) Supervisory training
_____ (3) Technician training
_____ (4) Plant management
_____ (5) Job upgrading
_____ (5) Executive development
Other (write in below)
_____ (6) ____________________
_____ (7) ____________________
_____ (8) ____________________

I. General comments: (Add any comments which you, or other officials of your firm may wish to make about the improvement of education and training opportunities in the ______________ area. Include your suggestions as to the kind and level of educational programs which should be provided. Your comments will be of great value to the Citizens' Study Committee).

Please return this questionnaire at once in the envelope provided.

Thank you for your interest and cooperation.

______________ Citizens' Study Committee

Sample 3

Information Sheet for High School Seniors

READ THIS BEFORE YOU BEGIN:

A study is underway aimed at improving educational opportunities in this area. You can help, too, by answering each of the questions which follow.

This is not a test. The answers you give will not affect your grades. Neither your teachers nor your classmates will see your answers. DO NOT SIGN YOUR NAME.

For the most part you simply check the questions that apply to you. Please answer all questions as completely as possible.

1. Sex (Check one.)
_____ 1. Boy. _____ 2. Girl.

2. Which of the following best describes your high school program of study? (Check one.)
_____ 1. Commercial or business education.
_____ 2. College or university preparatory.
_____ 3. Shop or industrial arts.
_____ 4. Agriculture.
_____ 5. Homemaking or home economics.
_____ 6. General.
_____ 7. Other. (Write in.) _____________________________

3. List the number of extra-curricular school activities, such as clubs, athletics, band, orchestra, choir, student government, etc., in which you participate this year.
_____ 1. (Write figure.)

4. If you participate in two extra-curricular activities or less, check one of the reasons why you are not in more. (Check one.)
_____ 1. Not interested in any other activities.
_____ 2. Can't afford to belong to more.
_____ 3. Ride a school bus.
_____ 4. Work.
_____ 5. Don't make high enough grades.
_____ 6. Think the kids in the other activities are unfriendly.
_____ 7. Other reasons. (Write in.) _____________________________

5. To the best of your knowledge, where do you rank in your graduating class? (Check one.)
_____ 1. Top third. _____ 2. Middle third. _____ 3. Lower third.

6. With whom do you live while attending school? (Check one.)
_____ 1. Mother and father.
_____ 2. Only mother (with or without stepfather).
_____ 3. Only father (with or without stepmother).
_____ 4. Other. (Write in) _____________________________

7. How long have you lived in this school district? (Check one.)
_____ 1. Less than a year. _____ 3. 3 to 5 years. _____ 5. Over 10 years.
_____ 2. 1 to 2 years. _____ 4. 6 to 10 years.

8. What do you plan to do on a full-time basis the first year after high school graduation? (Boys check one only; girls may check one or two.)
_____ 1. Work.
_____ 2. Enter military service.
_____ 3. Become a housewife.
_____ 4. Attend college or university.
_____ 5. Attend business college.
_____ 6. Attend trade or technical school.
_____ 7. Other. (Write in) ______________________________
_____ 8. Don't know.

9. How well do you think your high school is preparing you for what you plan to do after graduation? (Check one.)
_____ 1. Providing just what is needed.
_____ 2. Very well in some ways but in other ways preparation is not adequate.
_____ 3. Fairly well but all the training could be improved.
_____ 4. Poorly.

10. How do you think the high school could prepare you better? (Write in.)
____
____
____

11. List one job which would be your first preference to be doing ten years from now. (Write in.)
____

12. If you plan on some additional educational training after graduation, what is the one field of greatest interest you want to study? (Write in.)
____

13. Do you plan to attend college or university? (Check one.)
_____ 1. Yes definitely.
_____ 2. Probably so.
_____ 3. Probably not.
_____ 4. No.
_____ 5. Don't know.

14. If you plan to go to college, where do you plan to enroll? (Answer only if you checked either 1 or 2 in Question 13.)
_____ 1. University of Hawaii
_____ 2. Other college in Hawaii (please name it) ______________________
_____ 3. A technical school in Hawaii (name) ______________________
_____ 4. A college on the mainland (name) ______________________

15. How much help have you received in high school in deciding what you plan to do after graduation? (Check one.)
_____ 1. A lot of help, all you need.
_____ 2. Considerable help but you could have used more.
_____ 3. Some help but not very much.
_____ 4. Little or no help.

16. What do your parents feel about whether or not you attend college? (Check one.)
_____ 1. Insist or expect you to go.
_____ 2. Want you to go if you want to.
_____ 3. Don't care one way or the other.
_____ 4. Don't want you to go.
_____ 5. Won't allow you to go.
_____ 6. Don't know what they think.

17. How much education has your father had? (Check one.)

_____ 1. Eighth grade education or less.
_____ 2. Some high school.
_____ 3. Graduated from high school.
_____ 4. Business or trade school.
_____ 5. Some college.
_____ 6. Graduated from college.
_____ 7. Don't know.

18. How much education has your mother had? (Check one.)

_____ 1. Eighth grade education or less.
_____ 2. Some high school.
_____ 3. Graduated from high school.
_____ 4. Business or trade school.
_____ 5. Some college.
_____ 6. Graduated from college.
_____ 7. Don't know.

19. Which of the following relatives have attended college? (Check all that apply.)

_____ 1. Sister or brother.
_____ 2. Aunt, uncle, or cousins.
_____ 3. None.

20. Do you have a part-time job during school? (Check one.)

_____ 1. Yes. _____ 2. No. _____ 3. None.

21. Check one of the following that best describes your family's income.

_____ 1. Frequently have difficulty making ends meet.
_____ 2. Sometimes have difficulty in getting the necessities.
_____ 3. Have necessities but not many luxuries.
_____ 4. Comfortable but not well-to-do.
_____ 5. Well-to-do.
_____ 6. Wealthy.

22. How would you rate the following high school services, experiences, or facilities? (Opposite each item check either "excellent," good," or "poor.")

	Excellent	Good	Poor
1. Counseling or guidance on school problems.	1._____	2._____	3._____
2. Counseling or guidance on personal problems.	1._____	2._____	3._____
3. Counseling or guidance on vocational choice.	1._____	2._____	3._____
4. Counseling or guidance on college education.	1._____	2._____	3._____
5. Library materials and information on vocations.	1._____	2._____	3._____
6. Courses offered.	1._____	2._____	3._____
7. Social activities.	1._____	2._____	3._____

NOTE: Answer the following questions ONLY if your future plans include "NOT" or "PROBABLY NOT" going to college as indicated in Question 13. (If you answered, "yes, definitely," "probably so" or "don't know," to Question 13, skip this entire section and do not answer.)

23. Which of the following types of training or education interest you most? (Check one.)

_____ 1. Paid apprenticeship as a helper to learn a trade.
_____ 2. On-the-job training with a company or industrial firm.
_____ 3. Correspondence study.
_____ 4. Post-graduate high school work in high school at night.
_____ 5. Adult education classes.
_____ 6. Military service or training.
_____ 7. None of the above.

24. What is the most important reason why you do not plan to go to college? (Check one.)

_____ 1. Tired of school.
_____ 2. Want to work and make money.
_____ 3. Can't afford it.
_____ 4. Parents don't want me to.
_____ 5. Can be just as successful without going to college.
_____ 6. Waste of time.
_____ 7. Couldn't make good enough grades.
_____ 8. Want to get married.
_____ 9. Other. (Write in.) _______________

25. Would you go to college if you had more money? (Check one.)

_____ 1. Yes. _____ 2. No. _____ 3. Maybe.

26. If you answered "yes" or "maybe" you would go to college if you had more money, how much would you need? (Check one.)

_____ 1. Enough to pay all expenses ($1,200 to $1,500 per year).
_____ 2. Enough to pay half of the expenses ($600 to $750).
_____ 3. Enough to pay less than half of the expenses ($0 to $599 or $749).

Do Not Sign Your Name

Please return questionnaire to your teacher.

Thank you for your cooperation.

_____________ County Citizens' Committee

Sample 4.

Parent Questionnaire

The purpose of this questionnaire is to gather information and opinions from parents of children now in the eighth grade about long-range plans for education and training. The information and opinions obtained will become a part of an area study now being conducted by ____________________ in cooperation with the schools in the area and the Citizens' Survey Committee studying the establishment of a community college.

You can aid in this study by completing this brief questionnaire for the Committee. Please return the questionnaire in the envelope provided as soon as possible. The results will be for statistical purposes only, so please do not sign your name.

1. Sex of eighth grade child.
   ____ 1. Male ____ 2. Female

2. Number of children now in school (1-12 grades). ____________________

3. Father's occupation ____________________
   (Be as specific as possible)

4. Location of father's employment. (Check one.) (Fill in local situations here as neede
   ____ 1. ____________ ____ 4. ____________
   ____ 2. ____________ ____ 5. ____________
   ____ 3. ____________ ____ 6. ____________

5. Mother's occupation ____________________
   (If housewife, so state)

6. Location of mother's employment. (Check one.) (Fill in local situations here as neede
   ____ 1. ____________ ____ 4. ____________
   ____ 2. ____________ ____ 5. ____________
   ____ 3. ____________ ____ 6. ____________

7. How long have you lived in your present school district as a family? (Check one.)
   ____ 1. Less than one year. ____ 3. Over 5 but less than 10 years.
   ____ 2. 1 to 5 years. ____ 4. Over 10 years.

8. How much formal (in school) education did you have? (Check the highest level completed.)

a. FATHER	b. MOTHER
____ 1. Eighth grade education or less.	____ 1. Eighth grade education or less.
____ 2. Some high school.	____ 2. Some high school.
____ 3. Graduated from high school	____ 3. Graduated from high school.
____ 4. Some college.	____ 4. Some college.
____ 5. Graduated from college.	____ 5. Graduated from college.

9. In view of your child's scholarship record so far in school, how much further education do you plan for him (her) to complete? (Check one or more.)
   ____ 1. High school, with college preparatory major.
   ____ 2. High school, with a vocational emphasis.
   ____ 3. Two-year junior or community college, if one were available locally, and if it offered varied programs of occupational education as well as college "transfer" work.
   ____ 4. Four-year college or university.
   ____ 5. Undecided.

10. Are you interested in your child's preparing (education and training) for entry into a skilled trade? (Usually requires high school and/or vocational education plus a period of apprenticeship.) (Check one.)

_____ 1. Yes   _____ 2. No

If you checked yes, indicate those fields of work which are in accord with your present thinking. (Check more than one, if you like.)

_____ 1. Air conditioning and refrigeration.
_____ 2. Auto body and fender
_____ 3. Auto mechanic
_____ 4. Cabinet maker
_____ 5. Carpenter
_____ 6. Cook, commercial
_____ 7. Cosmetology
_____ 8. Custodian
_____ 9. Dressmaker, tailor
_____10. Electrician
_____ 11. Machinist
_____ 12. Nurse's aid
_____ 13. Plumbing and pipe fitting
_____ 14. Practical nurse
_____ 15. Printing
_____ 16. Radio and TV repair
_____ 17. Welder
_____ 18. Waiter or waitress
_____ 19. Other (write in) _____
_____ 20. Undecided.

11. In general, whom do you feel should go to college? (Check one.)

_____ 1. Those with superior academic ability only.
_____ 2. Those with ability who have the financial means.
_____ 3. All who have the ability to profit from either academic or occupational education, regardless of financial means.
_____ 4. All who wish to try.
_____ 5. Other (specify) _____

12. How certain are you that your eighth grade child will attend college? (Check one.)

_____ 1. Definitely plan on his (her) attending.
_____ 2. Probably attend.
_____ 3. Uncertain.
_____ 4. Probably not attend.

13. Are you interested in your child's preparing for entry into semi-professional, technical, or business occupations? (Usually requires two years of college-level education and training.) (Check one.)

_____ 1. Yes   _____ 2. No

If you checked yes, indicate those which are in accord with your present thinking.

_____ 1. Accounting
_____ 2. Agriculture
_____ 3. Architectural drafting
_____ 4. Banking
_____ 5. Chemical technology
_____ 6. Civil technology
_____ 7. Dental assisting
_____ 8. Drafting
_____ 9. Electronic data processing
_____10. Electronics technology
_____11. Homemaking
_____12. Laboratory technology
_____13. Medical technology
_____14. Mechanical technology
_____ 15. Music
_____ 16. Nursing
_____ 17. Radio-television technology
_____ 18. Refrigeration & air conditioning technology
_____ 19. Retail selling
_____ 20. Salesmanship
_____ 21. Secretarial
_____ 22. Surveying
_____ 23. X-ray technology
_____ 24. Undecided
_____ 25. Other (write in) _____
_____

14. Are you interested in your child's preparing for a professional career? (Ordinarily requires graduation from a four-year college, and frequently requires an advanced professional degree. Good scholarship, represented by a B or better average in high school college prep courses, is becoming the normal expectation.)

_____ 1. Yes _____ 2. No

If you checked yes, indicate the profession (write in)______________________________
____

15. If you are interested in your child's receiving post-high school level education and training, check the item(s) which describe(s) the current status of your planning to finance his (her) college education and training.

_____ 1. No plan at present.
_____ 2. Am leaving it up to the child.
_____ 3. Have a definite educational savings program.
_____ 4. Will help child to work his way through.
_____ 5. Expect child to win scholarship.
_____ 6. Expect child to get training at government expense (Armed Service Schools).
_____ 7. Expect a public-supported post high school program, such as a community college.
_____ 8. Other (specify) ______________________________
____

16. Assuming that an accredited comprehensive community college is established on __________________ in time for your present eighth grade child to attend it four years from now; and further assuming that it offers a quality college-parallel program for the first two years, plus a wide variety of occupational education programs; and further assuming that the tuition charges may be of the order of $150-$200 per year, please answer the following:

_____ 1. I definitely would plan to send my child to the community college for one of the occupational programs checked above in items 10 and 13.
_____ 2. I definitely would plan to send my child to the oommunity college for a two-year college parallel program so he (she) could then transfer to a university or four-year college.
_____ 3. I plan to send my children direct to the University of Hawaii.
_____ 4. I plan to send my children to college on the mainland.
_____ 5. My children will probably not go beyond high school.

17. In what additional education, if any, would the heads of the household be most interested? (Check one.)

FATHER	MOTHER
_____ 1. None.	_____ 1. None.
_____ 2. Work on college degree.	_____ 2. Work on college degree.
_____ 3. Courses for job improvement.	_____ 3. Courses for job improvement.
_____ 4. Courses for self-improvement.	_____ 4. Courses for self-improvement.
_____ 5. Other (specify)______________	_____ 5. Other (specify)______________
______________________________	______________________________

Return the questionnaire in the envelope which is provided.

Thank you for your help.

______________County Citizens' Study
Committee

APPENDIX B

CORE CURRICULUM SUGGESTIONS

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The University of Michigan

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SUGGESTED CORE CURRICULUM
FOR
COMMUNITY COLLEGE TECHNICAL EDUCATION PROGRAMS

Introduction: There is a wide spectrum of technical occupations in industry, ranging in complexity and sophistication from engineering-related work in research, design, and prototype production (engineering technologies) to more-or-less routine work in production, testing, maintenance, and operating (industrial technologies). Community colleges should offer technical education programs at both of these levels, in order to accommodate the differing interests and abilities of students and also to provide future technicians for a wide range of technical jobs in industry.

Selection and Recruitment: As a tentative guide for selection and recruitment of students interested in engineering, technology, and trade and industrial programs, experience in many junior colleges has shown that, based on SCAT scores and high school grades:

1. Students above the 70th percentile (especially if Q-scores are high) should be encouraged to enter lower division engineering programs, with a baccalaureate degree objective.
2. Students falling between the 50th and 70th percentiles are ordinarily good prospects for engineering technician programs.
3. Students who rank as low as the 30th percentile may be accepted for enrollment in industrial technician curriculums.
4. Students who rank below the 30th percentile should ordinarily be placed in a trade-level program.

A Core Curriculum: Technical education programs designed to educate engineering technicians and those designed for industrial technicians have a number of common factors. Both involve emphasis on mathematics and science, and both should include certain general education experiences in English, history, economics, psychology, and similar courses. Engineering technicians must have far greater depth of preparation in mathematics and certain aspects of science than is necessary for industrial technicians; and the content and rigor of certain courses in the major technical specialty is greater for the former than for the latter; but there are enough common elements that a core curriculum for the freshman year (and certain general education courses of the sophomore year) is not only possible, but has much to recommend it.

All technician students need at least one year of college mathematics, and a full year of college physics, with laboratory. Considerable additional work in mathematics and in science-related technologies will be needed in the sophomore year by students in engineering technician programs. The mathematics and physics courses for technicians should be specifically designed for technical curriculums. Neither the classical mathematics sequence nor the general college physics course is suited to two-year programs for technicians. And engineering physics, since it involves calculus from the outset, is not suitable either.

The Freshman Year

A suggested pattern of courses for the freshman year (suitable for both industrial and engineering technicians), follows:

First Year Core Curriculum

Course	Units	Hours Per Week	
		Lecture	Laboratory
English A - B	3 - 3	3	
Technical Mathematics A - B	3 - 3	3	
Technical Physics A - B	4 - 4	3	3
Introduction to Graphics A - B	1 - 1		2
Technology Laboratory A - B	3 - 3	1	6
Major Technical Specialty	5 - 5	3	6
Totals	19 19	13	17

Total class hours per week--30

It will be noted that this pattern of courses and time assignments constitutes a "heavy" load, compared to the 16 units per semester, which is commonly accepted as a "full load" for college students. It is exceptionally heavy, but this cannot be helped. The knowledge and skill demands of the technical occupations are such that the preparation of a competent technician in a two-year program requires this kind of application. Students with four years of high school mathematics might be allowed to waive Technical Mathematics A (by examination) and students with two or more years of high school drafting, might skip Introduction to Graphics A. Another way to allow for lightened loads in the regular academic year is to encourage summer session attendance, where certain of the required courses might be offered.

The Sophomore Year

The student's academic performance in the freshman core of courses may well determine his objective--engineering technician or industrial technician. The sophomore pattern of courses suggested below may be used as a framework on which to build second-year programs for either objective. The general education courses are common to both objectives, but the sophomore mathematics would be required only for engineering technicians. The technical specialty courses for engineering technician students would probably all be different from and more rigorous than those designed for industrial technician students.

Second Year Curriculum

Course	Units		Hours Per Week			
			Lecture		Laboratory	
American History	3		3			
Economics		3		3		
Psychology	3		3			
*Technical Mathematics C	3		3			
**Technical Mathematics D		3		3		
***Major Technical Specialty Courses	10	12	5	6	18	18
Totals	19	18	13	12	18	18

Total Class Hours 1st Semester--31
Total Class Hours 2nd Semester--30

---

* Required of all engineering technician level students.

** Required only for Electronics Technology majors at the engineering technician level.

*** Industrial technician students, since sophomore mathematics is not required, could be scheduled for greater blocks of time in technical and skill courses in laboratory and shop.

Brief Description of the Courses in the Core Curriculum

English A - The standard course in English composition for non-transfer majors. A study of functional grammer, mechanics, and spelling. A major objective of the course is to develop skill and correctness in expository writing.

English B - Literature for the non-transfer student. The readings are selected from materials whose level of sophistication is such that they will hold the student's interest. Written and oral reports, and interpretive discussions form the basis of class activity.

Technical Mathematics A - Mathematics designed for and concerned with technician training. The objective of this first course is to develop a reasonable level of ability in algebra, geometry, trigonometry, logarithms, and slide rule. However, it is not segmented into these "compartments." It is a synthesis of all of them, with an "applied" approach.

Technical Mathematics B - Continuation of Semester A. An intensive and rigorous development of more advanced topics in algebra and trigonometry, including simultaneous equations, quadratics, determinants, trigonometric identities, complex numbers, and J-operator. Further work in slide rule is offered. An introduction to vectors and graphic solutions is included. All topics are taught with emphasis on applications to engineering-technical work, and with careful attention to sequence.

Technical Physics A - Three hours of lecture and three hours of laboratory per week. Covers the following major divisions: properties of matter, mechanics, and heat. Elementary thermodynamics is emphasized. Applications to mechanical and civil technology are stressed. A rigorous, but non-calculus course which features much problem-solving and meaningful laboratory work.

Technical Physics B - Continuation of Semester A. Sound and light are studied rather thoroughly, but major emphasis is reserved for electricity, electronics, and an introduction to atomic and nuclear energy. The strong emphasis on problem-solving is continued, and the laboratory experiments take on the character of actual investigations requiring well-written technical reports as a part of each exercise.

Introduction to Graphics A - One two-hour laboratory per week. Basic drafting techniques, introduction to orthographic projection and isometric drawing. Use of engineering standards and handbooks. Dimensioning, sectional views; oblique and perspective systems. Elementary vector graphics, introduction to "simplified" drafting and elementary nomography.

Introduction to Graphics B - Continuation of Semester A. Intermediate and advanced orthographic projection. Additional and more advanced work in vector graphics, nomography, "simplified" drafting, and "exploded views." Introduction to freehand sketching.

Technology Laboratory A - One hour lecture and six hours laboratory per week. A processes and materials course intended to give future technicians a broad familiarity with production processes. Precision measurement; engineering standards; materials testing (destructive and non-destructive); elementary metallurgy; heat treating; introduction to welding; elementary foundry practice.

Technology Laboratory B - Continuation of Semester A. Covers manufacturing processes. Introduction to machine tools and machining processes; sheet metal and plastics fabrication; introduction to manufacturing systems; estimating; production testing.

The Major Technical Specialty - This is the program in the technical field which the student has selected as his major interest. Two (or three) lecture hours and from six to fifteen lab/shop hours per week.

Technical Mathematics C - Covers applied analytic geometry and applied calculus, and is designed to give technician students a working knowledge (not a mathematician's knowledge) of these subject matter fields, which will enable them to work intelligently with engineers and scientists.

Technical Mathematics D - Is designed specifically for electrical-electronics majors, and may include concentrated work in number theory, additional topics in calculus, logical systems, Boolean algebra, mathematics of analog and digital computers, and the mathematics of specialized electronic circuits. The scope and sequence should be adjusted to the demands of the sophomore work in electronics technology being offered at the college.

The history, economics, and psychology courses might possibly be selected from the regular "transfer" courses in such fields, but counselors should consider each case on its own merits. A strong argument can be advanced that, for the economics and psychology work, the student whose goal upon graduation is immediate employment as a technician needs a course different from that provided for the student who is taking the first course in a subject matter field which may be his major for a baccalaureate degree. The emphasis should be on applied economics, and applied psychology.

It will be noted that very little of such a program is "transferable" for baccalaureate degree credit. In one sense this is regrettable, of course, but such loss of degree credit is not unique to technical education. Any change of educational objective always entails additional work. The transfer engineering student would face a great deal of "make-up" work also if he decided to change his objective to astronomy or life science. After careful testing and counseling procedures have been completed, if the joint decision between student and counselor is for a technician career objective, then the curriculum must be tailored for that objective, not "doctored" to bring about some sort of hybridization between engineering and technology.

Other Occupational Education Fields.

The courses and patterns discussed above are for technical level programs only. Similar core curriculums can be worked out for trade-level programs and for programs in the business and service occupations.

The core curriculum approach, especially for the freshman year, is strongly encouraged.

APPENDIX C

SUGGESTIONS FOR COURSES AND SEQUENCES IN TECHNICAL MATHEMATICS AND TECHNICAL PHYSICS FOR COMMUNITY JUNIOR COLLEGE TECHNICIAN TRAINING PROGRAMS

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MATHEMATICS FOR TECHNICIANS

A Suggested Two-Year Sequence For Engineering and Industrial Technicians in Community Junior Colleges

The Rationale:

High school graduates who decide to enroll in community junior college technical education programs can, for convenience, be divided into three categories:

1. Those students with a fair amount of academic ability, and an interest in mathematics and science, and who may eventually become research- and design-oriented engineering technicians.* These students usually present high school records which include at least two (and usually three) years of high school mathematics, one year of laboratory science, and significant work in English, history, and similar college preparatory subjects. Their over-all scholastic standing should indicate that they are at or above the mean of their graduating class.

2. Students who may not have been classified as "college preparatory" in high school, but who nevertheless have completed elementary algebra and perhaps plane geometry, and whose overall scholastic standing places them at or above the 30th percentile of their graduating class. This group of students might well be considered as future industrial technicians.

3. Students who were either "general" or "vocational" majors in high school, with little background in mathematics and/or science, but who show evidence (either from standardized test scores or high school grades) that they could undertake academic work in the junior college, if they were given an opportunity to remedy their deficiencies in mathematics and English before actually beginning a technical education curriculum. These students too, might be considered as future industrial technicians.

The Technical Mathematics sequence herein proposed is designed for Categories 1 and 2 above. Students who will graduate as engineering technicians would be expected to complete the entire sequence. Those whose abilities were found to be more consistent with the job demands of the industrial technician might complete only the first two semesters.

Students in Category 3 above, would be advised to complete elementary algebra and plane geometry before starting the Technical Mathematics sequence.

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* It is assumed that students of superior abilities in these fields will be interested in engineering programs, not technician programs.

Semester A

(Prerequisite: A knowledge of elementary algebra)

Topic I Introduction And Review . . . . 1 week

The number system. The decimal system and computations with decimals. Powers of ten and computation with large and small numbers. Fundamental operations and order of operations. Units and dimensions. The equals sign and its integrity as regards dimensions. Significant figures and standards of accuracy in computation. How to estimate answers.

Topic II Simple Linear Equations . . . . 2 weeks

Equations as formulas. Use of formulas in solving problems in physics, chemistry, electricity, and engineering. The basic idea of equality. Expressing word problems as equations and formulas. Review of the fundamental laws of algebra. Practice in the solution of simple problems involving formulas and linear equations.

Topic III Algebraic Processes . . . . 3 weeks

Definitions. Rules for algebraic operations. Literal numbers. The four fundamental operations. Factoring and special products. Fractions, simple and complex. Powers and roots. Negative, zero, and fractional exponents. Ratio and proportion. Variation. Operations with radicals. Rationalization of denominators. Further solution of linear equations.

Topic IV Elementary Topics in Geometry and Trigonometry . . . . . 3 weeks

Review of basic geometry. Angle measurement. The circle and related problems. Triangles and related problems. The trigonometric functions. Trigonometric tables and their use. The unit circle. Solution of right triangles by trigonometry. Simple trigonometric equations.

Topic V The Slide Rule . . . . 2 weeks

The scales and how to read them. Multiplication and division. Setting the decimal point. Raising numbers to powers and extracting roots. Ratio and proportion. Trigonometry on the slide rule.

Topic VI Vectors . . . . 2 weeks

Directed line segments. Vector quantities vs. scalar quantities. Components of a vector. Resolution of vectors. Composition of vectors by the parallelogram method and the triangle method. Resultants and equilibrants. Vector solutions of force, displacement, and motion problems. Vectors and the trigonometric functions. The vector polygon.

Topic VII Logarithms . . . . 2 weeks

Definitions. Relation of logarithms to powers of ten. Logarithms to the base 10. Laws of logarithms. Tables of logarithms to base 10. Calculations with logarithms. Logarithms of trigonometric functions. Natural (base "e") logarithms.

Topic VIII Graphical Representation . . . . 3 weeks

Concepts of variability. Interpreting and plotting graphs. Graphs of linear equations. The concept of "slope." Point--slope form of equation of a straight line. Slope intercept form. The linear function.

Note that the objective in Semester A is to develop a modest ability to work in several mathematical fields (algebra, geometry, trigonometry, vectors, graphics, slide rule) as quickly as possible, so that the student may use these concepts in the technical physics course and in his technical specialty courses.

Semester B

(Prerequisite: A "C" in Semester A, or four years of high school mathematics)

Topic I Simultaneous Linear Equations . . . . 2 weeks

Concept of two unknowns. Graphical solution. Algebraic solution. Method of determining constants. Problems with three and more unknowns. Determinants. Solution of problems with determinants.

Topic II Quadratic Equations . . . . 2 weeks

Definitions. Solution by factoring. Solution by the quadratic formula. Nature and properties of roots. Graph of the quadratic function. The parabola.

Topic III Algebraic Functions . . . . 2 weeks

Functional notation. Rectangular coordinates. Polar coordinates. Polynomials. Graph of a polynomial. Roots of a polynomial.

Topic IV Logarithmic and Exponential Functions . . . . 1 week

Review of exponents and logarithms. Graphs of exponential and logarithmic functions. Exponential equations.

Topic V Trigonometric Function Analysis . . . . 3 weeks

Review of basic trigonometry. Law of sines. Law of cosines. Law of tangents. Functions of ½ angles and sum and difference of two angles, and multiple angles. Trigonometric identities and trigonometric equations. Periodic nature of trigonometric functions. Sinusoidal functions. Harmonic motion.

Topic VI Complex Numbers . . . . 2 weeks

Imaginary numbers. Complex numbers. The J-operator, and applications to electrical circuits.

Topic VII Vector Algebra . . . . 2 weeks

Addition and subtraction of complex numbers. Multiplication and division of complex numbers. Multiplication of vectors in polar form. Division of vectors in polar form.

Topic VIII Advanced Topics in Algebra . . . . 2 weeks

Sequences. Arithmetic and geometric progression. Series. Convergence and divergence. Harmonic series. Binomial theorem.

Topic IX Advanced Graphics . . . . 2 weeks

Similarities and analogies as a basis for problem solving. Plotting experiemental results. Empirical relationships. Elementary nomography. Graphic variation. Graphs of special equations.

The objective of Semester B is to give the student more depth in algebra, trigonometry, vectors, and graphics, and to lay the foundation for the study of analytical geometry and calculus by the more able students. Students whose objective (as determined on the basis of their interests and academic ability) is to become industrial technicians would now drop out of the technical mathematics sequence and devote that much more time during the sophomore year to technical specialty courses.

Semester C

(Prerequisite: Completion of Semesters A and B (or equivalent with a grade of "B" or better. Satisfactory completion of a year course in technical physics or engineering physics. It is assumed that most students electing this course are intending to become engineering technicians.)

Topic I Analytical Geometry . . . . 6 weeks

Points in space. Trigonometry in a rectangular system. Tangents and curves. The conic sections. Applications of curves and the equations of curves to problems in industry and engineering technology.

Topic II Differential Calculus . . . . 6 weeks

The application of the methods of the calculus to the solution of problems in mechanics, heat, wave motion, and selected industrial and engineering technology problems.

Topic III Integral Calculus . . . . 6 weeks

Emphasis on application of calculus to problems of industry and technology.

Students, except those in electrical and electronics technology, might consider the mathematics sequence completed at this point.

Semester D

(Prerequisite: Completion of Semesters A and B with a grade of "C" or better. Completion of a year of technical physics or engineering physics. Completion of a basic course in electric and electronic circuits.)

This course, although it might be elected by qualified students in mechanical technology, is intended primarily for advanced students in electrical-electronics technology.

Topic I Number Systems . . . . 4 weeks

Base 10. Place value. Number systems to other than base 10. Essential characteristics of a number system. Detailed study of base 2. The fundamental processes in various number systems.

Topic II Applications of Number Systems . . . . 6 weeks

Computer mathematics. Computer limitations. The analog computer and its applications. The digital computer and its applications. Elementary computer programming techniques.

Topic III Logical Systems . . . . 8 weeks

Introduction to Boolean algebra. Addition facts. Multiplication facts. Truth tables. Switching circuit algebra. And/or memory (logical) functions. Advanced mathematical treatment of electrical and electronic circuitry.

Summary:

Students who complete a four-semester technical mathematics program of the scope and sequence here recommended, along with a year (or more) of technical physics and/or chemistry, would be well prepared for the mathematics and physical science demands which would be made upon them as engineering or science laboratory technicians. Students whose capabilities exceed those required by the sequence here recommended should be encouraged to elect a degree program in engineering, rather than a technician program.

The technical specialty courses will differ greatly depending on whether the student's interest is in the field of mechanical technology, electronics technology, civil technology, etc. In any event some 36 to 40 semester credit hours (including laboratory courses) should be allocated to technical specialty courses.

The semi-professional technician should have the benefit of significant work in the general studies. Such courses as English, history, economics, psychology, and speech should be elected by both engineering technician and industrial technician students up to approximately 18 credit hours, or one-fourth of the total program for the associate degree.

Associate degree programs in the technologies almost have to be planned for 70 semester credit hours or more, in order to meet the requirements for semi-professional employment.

PHYSICS FOR TECHNICIANS

Suggestions For A Community College Technical Physics Course

The Rationale:

Physics is the basic discipline for all engineers and technicians. The new technology, which features a scientist-engineer-technician team approach to research, design, and production problems, demands a knowledge of physics on the part of all members of the team. Scientists and engineers need a highly rigorous, mathematically based approach to first year college physics, but the same approach is not suited to the needs of technicians, for several reasons:

1. Theory and practice are not in proper balance for the technical student's needs.
2. First year engineering physics is ordinarily calculus-based right from the start, and technical students do not have the proper mathematics background for the course.
3. In most first-year courses designed for physicists and engineers, the objective is to prepare students for further study of advanced topics in the field of physics. In contrast, the technician should have a physics course related to the practical applications which will confront him on his job.
4. Much of a technician's work is related to design, testing, and the construction of prototype components. Problem-solving, with relatively simple mathematical techniques (algebra and trigonometry for the most part) and laboratory work in mechanics, heat, and electricity should be stressed. These are not the primary objectives of the general college physics course nor of courses for students of science and engineering.

Consequently, it is essential to offer a specially planned physics course for technician students. The course herein proposed has been under development for fifteen years and has proved to be eminently satisfactory as a first-year physics course for technicians.

Necessity for Laboratory Work

Physics is, of necessity and tradition, a laboratory course. Physical laws, concepts, and hypotheses take on real meaning only when they are checked by actual observation. Since technicians are concerned with both theory and practice, and since the use of tools, instruments, and equipment constitute an important phase of the technician's work, the laboratory investigation aspect of physics is of vital importance in a course planned for technical students.

Two points are worthy of emphasis:

1. The experiments must be planned and the equipment selected (or perhaps even especially constructed) to further student understanding of the technical applications of the principles being studied.

2. The laboratory investigation and the laboratory report must be exercises which approximate the kind of investigations and reports required of technicians on the job.

THE COURSE CONTENT

Semester A

(Prerequisite: Successful completion of elementary algebra and plane geometry and a SCAT score which indicates a standing at or above the 20th percentile on national norms for college freshmen (or above the 30th percentile of their high school graduating class).)

Topic I Introduction . . . . 1 week

The importance of physics. How to study physics. Mathematics review covering simple linear equations, certain geometrical figures, and computations with decimals, powers of ten, and slide rule.

Topic II Precision Measurement . . . . 1 week

Measuring devices used in industrial and research laboratories, and in the physics lab.

Topic III Properties of Matter . . . . 3 weeks

The structure of matter, including atomic and electron theory. Properties of solids, liquids, and gases.

Topic IV Mechanics (Statics and Dynamics) . . . . 6 weeks

Force, motion, work, energy, and power. Vectors and graphic solutions of force, velocity, and acceleration problems. Statics applied to structures. Analysis of the basic machines and applications to the complex machines of industry. Friction and the principle of work. Dynamics of translation and rotation; torque; power transmission; centripetal and centrifugal force; elementary satellite mechanics.

Topic V Heat and Thermodynanics . . . . 6 weeks

Temperature and the effects of heat--expansion, thermoelectricity. Heat and change of state--the kinetic-molecular hypothesis. Heat transfer--conduction, convection, radiation. Elementary thermodynamics and the principles of heat engines. Refrigeration and air conditioning.

Semester B

(Prerequisite: Normally, students would be expected to have completed Semester A successfully. However, students with adequate mathematics skills (intermediate algebra, trigonometry, and slide rule) and previous high school physics might be allowed to enroll, if their SCAT scores meet the criteria listed above.

Topic I Sound and Acoustics . . . . 3 weeks

Periodic and simple harmonic motion. Theory of sound waves. Velocity of sound. Characteristics of sound--frequency, amplitude, wave complexity, loudness. Characteristics of musical sounds. Technical applications of sound and sound waves. Elementary acoustics.

Topic II Light and Optics . . . . 2 weeks

Nature of light--wave theory versus quantum theory. Velocity of light. Illumination. Reflection, refraction, interference, diffraction, and polarization of light. Mirrors, lenses, and prisms. The elementary principles of optical instruments.

Topic III Magnetism and Electricity . . . . 7 weeks

Theories of magnetism. Laws of magnetic attraction and repulsion. Terrestrial magnetism. Applications. Electrostatics--further study of electron theory. Basic electric (direct current) circuits. Sources and effects of electric current. Electromagnetism and electromagnetic induction. Alternating current theory and a-c circuits. Theory and applications of d-c and a-c machines. Production and distribution of electric power.

Topic IV Electronics . . . . 3 weeks

Vacuum tube and transistor fundamentals. Basic electronic circuits. Elementary industrial electronics. Elementary principles of electronic communication--radio, television, radar, microwave--transmitters and receivers.

Topic V Atomic Energy . . . . 2 weeks

Further study of the atom and of the atomic nucleus. Elementary treatment of nuclear fission and fusion processes. Military and industrial applications of atomic energy; atomic-electric power. Production and uses of radioisotopes.

Summary:

The physics course proposed above is eminently suitable in both content and rigor as a basic course for future technicians at semi-professional and highly-skilled levels. Its emphasis is on the technical applications of the science of physics rather than on physics as an end in itself. It is non-calculus based, but makes significant demands on the student's abilities in algebra, geometry, trigonometry, and numerical computation. The lectures should be accompanied by a weekly three-hour laboratory exercise which emphasizes applications to technology. It is planned for college students of middle-level abilities, for it is these students who will be tomorrow's technicians. Students of superior abilities should enter baccalaureate degree programs in science and engineering.